The Mental Status of Psychoneurotics

BF
21
A7
no.60

Tendler

Class 132.15
Book No. 40918

Northeastern University
Library

THE MENTAL STATUS OF PSYCHONEUROTICS

BY
ALEXANDER D. TENDLER, Ph.D.

ARCHIVES OF PSYCHOLOGY
EDITED BY R. S. WOODWORTH
No. 60

23-16927

NEW YORK
March, 1923

AGENTS: G. E. STECHERT & CO.: London (2 Star Yard, Carey St., W. C.); Paris (16, rue de Condé)

ARCHIVES OF PSYCHOLOGY

SUB-STATION 84, NEW YORK CITY. The Subscription price is five dollars per volume of about 500 pages. Volume I comprises Nos. 1-10, Volume II, Nos. 11-18, Volume III, Nos. 19-25, Volume IV, Nos. 26-32, Volume V, Nos. 33-39, Volume VI, Nos. 40-46, Vol VII, Nos. 47-52, Vol. VIII, Nos. 53-58, Vol. IX, 59-. The available numbers are as follows:

2. On the Functions of the Cerebrum: The Frontal Lobes: SHEPHERD IVORY FRANZ. 50c.
3. Empirical Studies in the Theory of Measurements: EDWARD L. THORNDIKE. 50c.
4. Rhythm as a Distinguishing Characteristic of Prose Style: ABRAM LIPSKY. 50c.
5. The Field of Distinct Vision: W. C. RUEDIGER. 70c.
6. The Influence of Bodily Position on Mental Activities: ELMER E. JONES. 50c.
7. A Statistical Study of Literary Merit: FREDERIC LYMAN WELLS. 30c.
8. The Relation Between the Magnitude of the Stimulus and the Time of Reaction: SVEN FROEBERG. 35c.
9. The Perceptual Factors in Reading: FRANCIS MARION HAMILTON. 50c.
10. Time in English Verse Rhythm: WARNER BROWN. 70c.
11. The Hearing of Primitive Peoples: FRANK G. BRUNER. $1.00.
12. Studies in Development and Learning: EDWIN A. KIRKPATRICK. $1.00.
13. The Inaccuracy of Movement: H. L. HOLLINGWORTH. 80c.
14. A Quantitative Study of Rhythm: HERBERT WOODROW. 60c.
16. On Certain Electrical Processes in the Human Body and their Relation to Emotional Reactions: FREDERIC LYMAN WELLS and ALEXANDER FORBES. 40c.
17. The Relative Merit of Advertisements: EDWARD K. STRONG, JR. $1.00.
18. Attention and Movement in Reaction Time: J. V. BREITWIESER. 50c. (Cloth, 75c.)
19. An Empirical Study of Certain Tests for Individual Differences: MARY THEODORA WHITLEY. $1.25. (Cloth, $1.50.)
20. Visual Acuity with Lights of Different Colors and Intensities: DAVID EDGAR RICE. 50c. (Cloth, 75c.)
21. The Curve of Forgetting: C. H. BEAN. 45c. (Cloth, 70c.)
22. The Influence of Caffein on Mental and Motor Efficiency: H. L. HOLLINGWORTH. $1.50. (Cloth, $1.75.)
23. Reaction Time to Retinal Stimulation. A. T. POFFENBERGER, JR. 70c. (Cloth 95c.)
24. Interference and Adaptability: ARTHUR JEROME CULLER. 75c. (Cloth, $1.00.)
25. Reaction to Multiple Stimuli: JOHN WELHOFF TODD. 60c. (Cloth, 85c.)
26. A Study in Incidental Memory: GARRY C. MYERS. $1.00. (Cloth, $1.25.)
27. A Statistical Study of Eminent Women: CORA SUTTON CASTLE. 80c. (Cloth, $1.05.)
28. The Mental Capacity of the American Negro: MARION J. MAYO. 60c. (Cloth, 85c.)
29. Experimental Studies in Judgment: H. L. HOLLINGWORTH. $1.25. (Cloth, $1.50.)
30. The Psychological Researches of James McKeen Cattell: A Review by Some of His Pupils. $1.00. (Cloth, $1.25.)
31. Fatigue and Its Effects upon Control: ISAAC EMERY ASH. 60c. (Cloth, 85c.)
32. The Transfer Effects of Practice in Cancellation Tests: MELVIN ALBERT MARTIN. 60c. (Cloth, 85c.)
33. The Intellectual Status of Children Who are Public Charges: J. L. STENQUIST, E. L. THORNDIKE, and M. R. TRABUE. 50c. (Cloth, 75c.)
34. The Relation of Quickness of Learning to Retentiveness: DARWIN OLIVER LYON. 50c. (Cloth, 75c.)
35. The Overcoming of Distraction and Other Resistances: JOHN J. B. MORGAN. 75c. (Cloth, $1.00.)
36. The Psychology of the Negro—An Experimental Study: GEORGE OSCAR FERGUSON, JR. $1.25. (Cloth, $1.50.)
37. The Effect of Distraction on Reaction Time: JOHN E. EVANS: $1.00. (Cloth, $1.25.)
38. The Effect of Humidity on Nervousness and on General Efficiency: LORLE IDA STECHER. 90c. (Cloth, $1.15.)
39. The Mechanism of Controlled Association: MARK A. MAY. 75c. (Cloth, $1.00.)
40. Recitation as a Factor in Memorizing. ARTHUR I. GATES. $1.00. (Cloth, $1.25.)
41. Mental Fatigue during Continuous Exercise of a Single Function: THOMAS RUSSELL GARTH. 85c. (Cloth, $1.10.)
42. A Psychological Study of Trade-Mark Infringement: RICHARD H. PAYNTER, JR. 85c. (Cloth, $1.10.)
43. Individual Differences and Family Resemblances in Animal Behavior: HALSEY J. BAGG. 70c. (Cloth, $1.00.)
44. Experimental Studies in Recall and Recognition. EDITH MULHALL ACHILLES. 90c. (Cloth, $1.25.)
45. The Morphologic Aspect of Intelligence: SANTE NACCARATI. 70c. (Cloth, $1.10.)
46. Psychological Examinations of College Students: F. EDITH CAROTHERS. $1.25.
47. The Effects of Practice on Judgments of Absolute Pitch: EVELYN GOUGH. $1.25.
48. An Experimental Study of Silent Thinking: RUTH S. CLARK. $1.40.
49. Some Empirical Tests in Vocational Selection: HERBERT W. ROGERS. 75 cents.
50. Adenoids and Diseased Tonsils: Their Effect on General Intelligence. MARGARET COBB. $1.00.
51. An Experimental Study of the Factors and Types of Voluntary Choice. ALFRED H. MARTIN. $1.50.
52. Some Well-Known Mental Tests Evaluated and Compared. DOROTHY RUTH MORGENTHAU. 80 cents.
53. Mood in Relation to Performance. ELIZABETH T. SULLIVAN. $1.00.
54. The Influence of Incentive and Punishment upon Reaction Time: ALBERT M. JOHANSON. 80c.
55. Psychological Tests Applied to Factory Workers: EMILY THORP BURR. $1.25.
56. A Study of the Relation of Accuracy to Speed: HENRY E. GARRETT. $1.25.
57. An Experimental Study of Hunger in Its Relation to Activity: TOMI WADA. $1.50.
58. Individual Differences as Affected by Practice: GEORGINA STICKLAND GATES. $1.00.
59. Studies in Industrial Psychology: ELSIE OSCHRIN BREGMAN. 90 cents.
60. The Mental Status of Psychoneurotics: ALEXANDER D. TENDLER. $1.25.

THE MENTAL STATUS OF PSYCHONEUROTICS

BY
ALEXANDER D. TENDLER, Ph.D.

ARCHIVES OF PSYCHOLOGY
EDITED BY R. S. WOODWORTH
No. 60

NEW YORK
March, 1923

AGENTS: G. E. STECHERT & CO.: London (2 Star Yard, Carey St., W. C.); Paris (16, rue de Condé)

Psych
BF
21
A7
no. 60

ACKNOWLEDGMENTS

The writer wishes to acknowledge his special indebtedness to Professor R. S. Woodworth for his many acts of kindness and his stimulating criticism. Thanks are also due to Professor H. L. Hollingworth and to Professor A. T. Poffenberger for their helpfulness. To Professor G. M. Hammond and the Staff at the Nerve Clinic of the Post Graduate Medical School and Hospital acknowledgment is due for their ready cooperation and diagnosis of cases.

6 Feb. 1952

CONTENTS

		PAGE
CHAPTER I	The Problem of the Psychoneuroses ..	5
CHAPTER II	Tests and Subjects	13
CHAPTER III	Comparisons with Normals	23
CHAPTER IV	Comparisons of Psychoneurotic Subgroups	31
CHAPTER V	Irregularity of Performance	43
CHAPTER VI	Intelligence and Psychoneurosis	55
CHAPTER VII	Summary and Discussion of Results ..	73

40918

The Mental Status of Psychoneurotics

CHAPTER I

THE PROBLEM OF THE PSYCHONEUROSES.

Modern Neurology has definitely accepted the distinction between organic and functional conditions. Although Neurology can state in fairly precise terms the nature of an organic lesion, its seat, and distribution of effects, it is still very much in the dark as to functional conditions. In fact, the tendency is to define a functional state negatively—as a condition that exists in the absence of any known well-established structural defect or alteration. True, the endocrinologist has tried to bridge the gap between the two, not always satisfactorily, and has moreover provoked the query as to whether inefficient glandular activity causes or results from a state of "mental unrest." However that may be, we shall work on the hypothesis that psychoneurotic conditions are psycho-biologic reactions which a distinct psychological approach may serve to help understand.

Three fairly well-defined forms of psychoneuroses appear in clinical practice. These are neurasthenia, psychasthenia, and hysteria. There is a tendency to use the terms neurasthenia and psychasthenia interchangeably. Beard originally used the term neurasthenia to cover the whole ensemble of physical and mental symptoms. This included physical fatigue, gastro-intestinal disturbances, headache, vague pains, obsessions, phobias, anxiety. More modern practice tends to regard the physical disturbances as neurasthenia, and the mental disturbances as psychasthenia. Psychasthenia, in turn, has undergone a division into obsessional neurosis, compulsion neurosis, and anxiety neurosis.

There is, then, a distinction drawn between neurasthenia and psychasthenia. To quote from I. Geike Cobb,[1] "From the diagnostic standpoint, then, we shall see, the modern concep-

[1]Manual of Neurasthenia.

tion of neurasthenia includes physical and mental fatigue on exertion, characteristic headache, gastro-intestinal disturbances, disorders of sensibility. It does not include phobias, obsessions, anxiety, or any other mental disturbance which it originally included."

Cobb continues further to distinguish between neurasthenia and hysteria; "Hysteria is a spasmodic disease which is characterized by sudden outbursts of energy and by temporary loss of self-control, by emotional disturbances, by hemianaesthesias, local paralyses, altered sensations, and by great preponderance in the female sex.

"It contrasts strongly with Neurasthenia point by point. Neurasthenia is characterized by great diminution in the nervous forces at the disposal of the individual—i.e., lack of energy; by no definite outbursts or sudden loss of self-control, but rather by a systematized weakness of purpose which is the analogy of the bodily asthenia; if any alterations in sensibility be present, they are invariably quite irregular, and never encountered as a hemi- or para-aesthesia; paralysis is not seen and finally the greater number of patients are among the male sex.

"In addition Hysteria may be said to be dependent upon a congenital condition, or at all events to be dependent upon heredity; whereas Neurasthenia is invariably produced by the environment, albeit some individuals are rendered prone to its development by their inherited disposition.

"Again, Hysteria is characterized by impairment and perversion of will power, but not of intellect, whereas the sufferer from Neurasthenia is unable successfully to undertake mental work owing to the ready fatigability of his intellectual powers."

Although it is possible on the basis of these differentiations to clinically diagnose the "types" of neurasthenia, psychasthenia and hysteria, it is very likely that if it were possible to grade symptoms on a sufficiently fine scale we would find these "types" converging upon one another. Here, then, mental tests would indeed be of service if they would provide a more adequate and reliable means of measuring psychoneurotic tendencies. On *a priori* grounds this seems to be perfectly feasible, inasmuch as mental tests, though involving specific tasks, do bring out central tendencies in mental ability. Psychoneurotic tendencies must be linked with the "mental con-

stitution" in a far more fundamental fashion than is indicated by terms of moral disapproval.

There are indications that the problems of the psychoneuroses are entering upon a stage of experimental procedure. By far the most advanced of these efforts has been in the field of "association," that is, the Free Association Test. Jung[2] has applied it especially to the task of uncovering pathological mental contents, has used it as a means of measuring recovery, and claims to have discovered "typical" hysterical reactions in it. The Kent and Rosanoff[3] standardization of the Free Association Test is indeed a valuable contribution as it renders possible an accurate comparison of abnormal reactions with normal ones on the basis of "frequency tables of responses." The frequency with which a given response occurs in connection with a stimulus word among a thousand normal subjects is taken as its "value," when divided by 10. Responses not given by these subjects are regarded as individual reactions. We thus have a scale for the measurement of associative reactions empirically determined. This can be put to a variety of uses and with the accumulation of more and more reliable norms of performance becomes a very efficient instrument for the study of individual and group differences. Its application to psychoneurotic conditions may render possible finer differential diagnoses and may reveal more fundamental tendencies.

The Woodworth Questionnaire for Emotional Stability aiming at a quantitative treatment of the symptoms generally given by neurotics is another valuable effort in this direction. The questionnaire consists of a series of questions referring to the symptoms commonly met with in dealing with neurotics. These were given to various groups of normals so as to test out the discriminative capacity of the questions individually and as a whole. In this way there was determined an empirical limit as to the number of symptoms that an individual may have and still be regarded as "normal" and also as to which symptoms he may have. The purpose of the test was to single out recruits who were to receive further examination. A valuable feature in the standardization of the test was that it avoided the statistical fallacy of selection that comes of deal-

---

[2]C. G. Jung, The Association Method, American Journal of Psychol. Vol. 21, 1910, pp. 219-269.

[3]Grace H. Kent and A. J. Rosanoff, A Study of Association in Insanity, American Journal of Insanity, Vol. 67, 1910.

ing with a selected group and of failing to check up results with the general run of mankind. Thus a number of people properly judged as normal exhibited neurotic traits, a fact which reduced the discriminative capacity of such traits.

Hollingworth[4] put this very test to a unique use, by giving it to groups of psychoneurotic soldiers, to cases of concussion and epilepsy before and after the announcement of the armistice. A rather surprising result appeared. There was a considerable reduction in the number of unfavorable symptoms given after the announcement of the armistice. There was thus obtained an objective measure of the "motivation" operative in psychoneurotics. This matter is taken up more fully later under the Irregularity of Performance.

Pressey[5] proposes a group test for the study of the emotions. There are four tests based on the principle of "cross out"; in the first test there are forty irrelevant words introduced into a story, twenty in the uninteresting section and twenty in the exciting, the score consisting of the difference between the number of words correctly crossed out in the exciting as compared with the uninteresting section; in the second test twenty brief paragraphs are provided, subjects are then given ten words emotionally toned and ten indifferent ones and are told to cross out all the letters in the first paragraph which occur in the first word and so on through, the score being the difference between the letters correctly crossed out in the two groups. In the third test there is obtained a measure of a person's tendency to emotionalize, the subjects being required to cross out all the unpleasant words in a list of which some are highly emotionally toned, some slightly and some not at all affectively colored; in the last test a measure of the influence of emotional stimuli upon memory is sought, the subjects being required to cross out all the words that they had seen before in a list of 150, half of which occur in the previous tests and contain an equal number of words of strong emotional coloring and words with no coloring, the other half again similarly divided, but not occurring in the previous lists. As a means of testing sensitivity to emotional stimuli under varying conditions, through the medium of language, the tests seem promising. They hold out the possibility of ascertaining individual

[4]Psychology of Functional Neuroses, Chapter VIII, H. L. Hollingworth.

[5]Journal of Applied Psychol. June, 1919.

and group differences and of varying the material so as to relate test findings to symptoms.

While the present investigation was going on, Hollingworth tested the intelligence of psychoneurotic soldiers, using for this purpose a Group Survey Test which comprised the Woodworth-Wells Substitution Test, Naming Opposites Test (Pintner-Pyle-Whipple), Word Building Test (Pintner-Pyle), Completion Test (Trabue Scale A), Memory Span for Digits. In addition the Cube Imitation test was given as an individual measurement to nearly every person who was examined individually. The Mental Age (final summary) was the average of the completion and the median of the other short tests. The results obtained are compared with mine under the appropriate sections.

At the outset we must note certain differences between the two investigations. The group of psychoneurotics here studied was a civil group in which no single definite motivation appears in such striking fashion as in the army group. Again the army group may not represent a true random sample of the total psychoneurotic group as it constituted a very small percentage of all the psychoneurotics in the army, most of whom were found to make better recoveries when not removed too far from the war zone. In the civil group no single definite selective principle can be made out. Again, these tests were given individually, while the majority of the tests in the army group were given as group tests.

Before closing this section on the applications of psychological tests to psychoneurotics, mention must be made of what might be termed a psycho-physiological approach. Under this heading might come experimentation with the 'psychogalvanic reflex" and "conditioned reflex." The former has been used in connection with the Free Association Test as an aid in determining pathological mental contents (Biswanger,[6] Wells[7]).

The latter opens up possibilities of marked experimental significance as the "conditioned reflex" has been put forth as an explanatory concept of psychoneurotic and other abnormal conditions. (Watson[8]). Krasnogorski[9] claims for the "con-

[6]L. Biswanger, Über das Verhalten des psychogalvanischen Phänomens beim Assoziationsexperiment, in Diagnostische Assoziationsstudien II Band, XI. von C. J. Jung.

[7]Wells, F. L. On certain electrical processes in the human body. Archives of Psychology, No. 16.

[8]Watson, J. B. Behavior and the Concept of Mental Disease. Journal of Phil. Psych. and Scientific Methods. Vol. XIII, No. 22.

[9]See Mateer—Child Behavior.

ditioned reflex" excellent powers of differential diagnosis between the defective, normal and neurotic child.

All these efforts are suggestive of the possibilities that inhere in a painstaking and reliable experimental approach. The variation and adaptation of psychological concepts, materials, and test procedure to the problems of the psychoneuroses holds forth the promise of a truer and better understanding of the nature of the neuroses and the factors productive of them. The present stage in the study of the psychoneuroses is comparable to the period when the problem of "evolution" turned from discussion to experiment for solution.

Psychologically conceived, the problem of the Psychoneuroses presents three broad aspects: "Drive," "Mechanism," and "Mental Content." Whenever we deal with a psychoneurosis, we deal with a response which is activated by some "psychobiotic need," a response which involves some sort of mental effort and ability at interpreting or misinterpreting, and a situation, specific or general, that has received some sort of "mental representation."

Various psychopathologists have claimed certain drives as playing a powerful role in the production of the psychoneuroses. To Freud, the sex drive and interferences with its "proper" development are at the bottom of a neurosis. Adler, breaking away from the teachings of Freud, seeks the source of all the neuroses in the drives of self-assertiveness and self-abasement. Sidis finds all the psychoneurotic difficulties to arise from the fear drive. The psychoneuroses of warfare seem to offer additional evidence as to the power of the fear drive. Trotter makes the gregarious impulse the mainspring of human activity and attributes to it a large share of abnormal behavior. Jung, rejecting the excessive sex insistence of Freud, sees at the bottom of all human strivings a general life-urge, interference with which is productive of a neurosis. This widening of the range of drives carries with it a suggestion of the possibility of mixed-drives being involved in the production of a psychoneurotic reaction.

As to mechanisms, various ones have been proposed as being involved in the psychoneuroses. The psychoanalytic school has its whole galaxy of mechanisms—conflict, repression, projection, identification, sublimation, introversion, conversion, extroversion, symbolization. Their name is legion. The French school of psychopathology has put forth the con-

cept of "dissociation" or deficiency of synthetic power as descriptive of the psychoneurotic pattern. Babinsky[10] sees in the suggestibility of hysterics the essential mechanism of the condition. More recently psychologists have attempted to interpret psychoneurotic responses in terms of clear-cut psychological processes—habit formation, memory, associative recall, inhibition, conditioned reaction, integration and redintegration, intelligence. It is to be observed that the description of psychoneurotic reactions and mechanisms involved in the production of such reactions lend themselves readily to the system of well developed concepts of psychology. The highly figurative, anthropomorphic, ethically and analogically backgrounded psychoanalytic mechanisms are largely unnecessary and block a true understanding of these conditions by fostering an easy confidence in unfamiliar terms.

The present investigation seeks by means of mental tests an answer to the following problems:

1. How do psychoneurotics as a composite group compare with normals?
2. Do mental tests show any reliable differences between the sub-groups—neurasthenia, psychasthenia, hysteria?
3. Do test findings suggest any explanatory concept?

[10]J. Babinsky, Definition de l'hystérie. Sociéte de Neurologie, 7 Novembre 1901. J. Babinsky and J. Froment, Hysteria or Pithiatism, 1918.

CHAPTER II

Tests and Subjects

The tests employed in this study were sufficiently numerous and varied so as to present an adequate measure in both higher mental processes and those of a relatively simpler sort. The tests fall into two groups—those for which age norms have already been obtained, and those without such norms, the material being standardized, however. The tests with age norms are: the A test, Dotting, Rote Memory, Knox Cube, Marble Statue, Woodworth and Wells Substitution test, Woodworth and Wells Hard Directions test, Trabue Completion test, Scale K, Evans and Castle's Number Finding test ("Number Checking"), Three Minute Free Association Test (Pyle). The tests without age norms are: Woodworth and Wells Mixed Relations 1, Ink Blots, Hampton Court Maze, Memory for Forms (Evans and Castle's modification from Thorndike).

The A test is one of a variety of tests known as "cancellation" tests. It was designed by Cattell and Farrand ('96) and used by many investigators. It is a blank containing 100 A's interspersed among other capital letters—500 in all. Various functions have been attributed to it. Bourdon ('95) used it as a measure of discriminative ability. Pillsbury ('08) regards it as one of the best tests of attention. Judd ('98) gives it a similar classification. Thorndike ('04) used it as a test of perception. Pyle ('13) gives it as a test of perception and attention. Pintner[1] used it as one of his Survey Tests. His procedure both as to giving and scoring the test was followed so as to utilize his age norms. The subject was required to cross out all the capital A's he could in one minute. The score was the number of A's crossed out.

The Dotting test was an adaptation of one given by Kirkpatrick.[2] Kirkpatrick's test consisted of fifty squares in each of which was the figure 1, 2, or 3 to indicate the number of marks to be made in the square. He gives norms in terms of the time taken to fill in 100 dots for ages 5 to 14. If we divide these by 100 we get a figure which gives approximately the

[1]Pintner, The Mental Survey.
[2]Studies in Development and Learning, Archives of Psychol. Vol. 12.

time required to make one dot for the different ages. My test differs from the one used by Kirkpatrick in that numbers written in the squares run from 1 to 5 in chance order and in that my subjects were given one minute's time to work. By dividing 60 by the number of dots made we get the time required to make one dot. This is comparable to the result obtained with Kirkpatrick's figures and gives us an opportunity of expressing, approximately, the performance of our subjects in terms of age development.

The Number Finding test consisted of a sheet of numbers from 1 to 50 arranged in a mixed order. The subject was told that all the numbers from 1 to 50 were included on the sheet and that he must begin at the small circle in the upper left hand corner of the sheet and then with his pencil make a line to 1, then to 2, then to 3, and so on for all the other numbers in regular order till the signal to stop was given. Two minutes were allowed for the test. The score was the number reached when the signal to stop was given.

Evans and Castle[3] gave this test to a group of normal children having a mental and chronological age 8.5 to 9.5, and a group of mental defectives having a mental age of 8.5 to 9.5 but a chronological age ranging to 15 with a median age of 11.8. In the Number Finding test the normal group reached a median score of 11 and the abnormal group a score of 12. The authors regard it as a test of maturity rather than a test of mental ability. In attempting to standardize this test the authors had found a rather regular progression in achievement with increase in age. Second grade children have a median of 9, sixth grade pupils 19, and adults 26. By interpolating between these figures we are able to express scores made on this test in terms of age development.

The Hampton Court Maze Test consists of a series of open and closed paths finally leading out. The subject is told to begin at the center (marked S) and to quickly mark out the shortest way out without getting into any of the closed paths. The test was scored for both time and errors. The time was taken in terms of seconds (by stop watch) and an error was a line departing from the shortest path.

Porteus[4] has used a series of mazes for testing the intelligence of feeble-minded and normal children. Porteus claims

[3]Evans and Castle, The Relation of Mental Age to Chronological Age. Jour. App. Psychol., Dec. 1918.

[4]Journal of Psycho-Asthenics, Vol. 19, June, 1915.

as a special advantage of the maze tests that they make a call upon such traits as foresight, prudence, planfulness, qualities that relate themselves more closely to social efficiency than do the functions tested by the Binet-Simon scale (linguistic tests). In a later study at Vineland, Porteus has found the series of maze tests correlating higher with ratings of industrial and social efficiency than did the Binet-Simon scale.

The Woodworth and Wells[5] Substitution Test affords us a measure of the formation of associations. This consists of a blank in which five geometric forms are repeated twenty times in chance order. At the top of the blank appears a line containing each of the forms once, with a number in each form. The subject is told to fill in on each of the forms the same number as he will find on that form in the key on top. The score in this test is the time (in seconds) taken to fill in half of the blank so as to use the norms given for the test by Pintner and Patterson.[6]

In the three-minute Free Association test is sought a measure of the flow of ideas when no external restriction is set upon it. The subject is told that he will be given three minutes in which to write all the words that come into his mind. He has to start with the word "cloud" and then follow it with whatever words he thought of but they were not to be sentences. The score was the number of words written. Norms for the test are given by Pyle.[7]

As a test of the fertility of the imagination we made use of an Ink Blot test. This consisted of five ink blots, for each of which the subject was allowed one minute to name as many associations as the blot suggested to him. The score in the test was the number of associations named in the five minutes. Subjects seemed to actively search for associations rather than passively wait for them to be suggested. The test has been used by Dearborn, Kirkpatrick, Pyle, Sharp. Kirkpatrick's averages show best results for grades 1, 2, and 3, a decline for grades 4, 5, and 6, a rise for grades 7 and 8. Pyle using 20 blots, with written response, found that children aged 8 to 14 averaged 6.4 to 12 responses in three minutes. Adults averaged 10.6 for the men and 9.8 for the women. The tendency seems to be for better scores in younger children. None

[5]Woodworth, R. S. and Wells, F. L. Association Tests, Psychol. Monog., Vol. XII, No. 57.
[6]Scale of Performance Tests.
[7]The Examination of School Children.

of these results are directly applicable to our tests, as the method of giving the test differs.

The Rote Memory test enables us to determine the subject's span for unrelated words. The list of words used is that given by Pyle—memory for concrete words. The list was read off in series of 3, 4, 5, 6, 7, 8 words, and the subject was asked to repeat each series. It was scored by giving one point for correct word and one point for correct position. With such procedure and scoring, Pintner gives age norms for this test.

Another form of memory test is the Knox Cube test. This consists of tapping four cubes in a varying order and the subject's repetition of this performance. The procedure followed is the one used by Pintner and Patterson in the Performance Scale. The norms given by these authors were used. The score consists of the number of lines correctly reproduced.

In the Memory for Forms test, a modification from Thorndike, the subjects were given a sheet containing 25 geometric forms and told to study them carefully for two minutes. Then they were asked to mark on another sheet the forms which they recognized. This second sheet contained the twenty-five forms originally studied interspersed among twenty-five new ones. In scoring, credit of one point was given for every form correctly recognized and one point was deducted for every form wrongly recognized. Evans and Castle using this test found that it separated the normal children from the defective pretty effectively, only 12% of the defective group reaching or exceeding the median of the normal group. Simpson[8] used the same test with a group of superior individuals and a group of inferior ones and obtained a similar result—the two groups were effectively separated by the test.

In the Marble Statue test the purpose is to determine the ability to reproduce meaningful, connected material. The story was read to the subject and he was asked to repeat it. The score was the number of items (ideas) correctly reproduced. Age norms are given for the test by Pyle.

The Woodworth and Wells Hard Directions test is described by the authors as a test for the ability to understand instructions. This is a blank calling for about twenty reactions that the subjects are to fill in. The directions are complicated by calling for conditional and alternative responses. The subjects were told to carry out the directions given on the

[8]Correlation of Mental Abilities.

blank. The score was the time taken to complete the entire blank and also the number of correct responses. Pintner and Toops'[9] standardization of the test provides age norms in terms of correct responses.

The Woodworth and Wells Mixed Relations Test I has for its object "to get some insight into flexiblity of mental performance." This is accomplished by calling for a different 'set' or 'adjustment' with each stimulus. It is a 'proportion' in which the first member sets the relation which the subject is to find for the second member. Several examples are given to the subject before he begins the test. Thus, Box:square—Orange:——, Woman:husband—Man:——, East:west—Day:——, Penny:copper—Nail:——. The score for the test is both the time required for all twenty reactions and the correct number of responses. The responses were written by the subject himself.

The Completion test used in this study is Trabue's Scale K,[10] suitable for adults. The mental functions measured by the 'completion' test are akin to these involved in the Mixed Relations test. Ebbinghaus ('97) described it as essentially a test of intelligence requiring the ability to combine separate impressions into a coherent whole. Simpson ('12) treats it under the heading of selective thinking. Trabue's standardization and reduction to sentence form make it an efficient instrument for measurement. Subjects were told to fill in the blank spaces with a single word that made sense and several sentences given by Trabue for preliminary practice were used for that purpose. Results were scored according to the responses and values given by Trabue. Norms for this scale were obtained from Trabue.

In treating the results, use was made of the interpolation method so as to give due weight to the actual scores made by the subject. Thus, if a subject made a score of 109 seconds in the Substitution test, his age rating would fall between age 10 and 11. (cf. Table 1). The interval between the norms there is 16. A score of 109 is 14 above 123, the norm for age 10. The subject is therefore credited with 10 plus 14/16 or 10.8.

Some of the tests had no norms beyond certain ages, eg. the substitution test and dotting had none beyond age 14. For these norms were estimated so that superior performance

[9]Pintner, R. and Toops, H. A. A Revised Directions Test. Journal of Educational Psychology, Vol. IX, March, 1918.

[10]Trabue, M. R. Completion Tests. Teacher's College Publication.

could be credited. In Hard Directions test beginning with age 13 the curve was smoothed so as to show more distinct progression. These estimates are indicated in Table 1.

TABLE I

Age Norms

	6	7	8	9	10	11	12	13	14	15	16	17	18
Substitution	280	180	158	141	123	107	106	96	90	80*	70*	60*	50*
Knox Cube	4	5		6			7			8		9	10
Rote Memory	3	18	30	32	36	38	39	41	42	43	44	45	47
Marble Statue			16	19	21	25	28	30	31	32	32	33	35
Dotting	1.42	1.17	.92	.65	.60	.53	.48	.47	.46	.40*	.30*	.20*	.10*
"A" test	16	25	28	31	35	39	45	50	53	56	59	61	
Number Finding			9	12	14	17	19	21	23	24	26	28*	30*
Free Association			23	27	33	37	42	46	50	53	56	57	58
Hard Directions		8	9	12	12	14	14	15*	16*	17*	18*		
		Ages		9½	10½	11½	12½	13½					
Completion		Score		2	3	4	5	6	7	8	9		10

*Norm is estimated—merely to rate superior performance.

SUBJECTS

There were two groups of subjects; one, a group of patients treated at a nerve clinic for psychoneurotic conditions, the other, a control group of normals. No principle of selection was exercised in either group other than that subjects be able to read and write English.

The following table describes the subjects more fully.

TABLE II. Psychoneurotic Subjects

No.	Name	Diagnosis	Sex	Age	School Grade
N1	E. G.	Neurasthenia	M	40	8
N2	A. M.	" "	M	36	4
N3	W. G.	" "	M	19	8
N4	P. S.	" "	M	40	4
N5	J. S.	" "	M	28	4
N6	J. G.	" "	M	20	8
N7	J. L.	" "	M	24	6
N8	M. T.	" "	F	24	9
N9	J. Q.	" "	M	35	8
N10	T. S.	" "	F	29	5
N11	A. K.	" "	M	29	5
N12	J. C.	" "	M	41	4
N13	H. F.	" "	M	22	9
P1	J. H.	Compulsion Neurosis	M	19	9
P2	M. C.	Anxiety Neur.	M	21	9
P3	E. L.	" "	F	19	12
P4	M. M.	Compulsion "	M	19	9
P5	D. G.	Anxiety Neur.	M	23	8
P6	R. N.	" "	F	19	9
P7	J. K.	" "	F	35	7
P8	H. S.	" "	M	22	7
P9	I. H.	" "	M	20	8

TABLE II.—Continued

No.	Name	Diagnosis	Sex	Age	School Grade
P10	J. B.	Compulsion "	M	23	16
P11	R. G.	" "	F	25	9
P12	W. H.	Anxiety "	M	25	12
P13	E. K.	" "	F	35	6
P14	V. H.	" "	F	18	6
P15	S. G.	" "	F	20	8
P16	J. A.	" "	F	19	7
P17	M. H.	" "	F	33	9
P18	P. L. S.	Compulsion "	M	35	8
P19	W. G.	" "	M	35	7
H1	M. U.	Hysteria	F	43	12
H2	J. McF.	"	F	30	6
H3	J. W.	"	F	22	12
H4	A. B.	"	F	20	12
H5	G. B.	"	M	40	9
H6	F. S.	"	F	19	10
H7	L. G.	"	M	29	8
H8	A. S.	"	F	19	8
H9	M. H.	"	F	25	7
H10	B. L.	"	F	19	8
H11	E. R.	"	F	20	12
H12	A. T.	"	F	40	12
H13	A. S.	"	F	19	9
H14	E. G.	"	F	21	8
H15	J. J.	"	F	22	11
H16	S. E.	"	F	29	9
H17	R. A.	"	F	25	7
H18	O. G.	"	M	20	8

The Compulsion Neurosis and Anxiety Neurosis will be treated under one heading—Psychasthenia.

Table III. Normal Subjects (Control Group)

No.	Name	Sex	Age	School Grade
1	L. S.	M	19	10
2	C. G.	M	22	16
3	F. T.	M	19	7
4	C. L.	M	25	8
5	I. C.	F	19	10
6	I. C.	M	18	8
7	E. G.	F	17	10
8	J. S.	M	30	6
9	M. T.	M	18	11
10	I. V.	F	20	9
11	R. M ..	F	29	9
12	E. P.	F	21	8
13	M. O.	F	24	9
14	E. S.	F	24	9
15	H. B.	M	26	9
16	L. H.	F	21	8
17	R. D.	F	24	9
18	C. D.	F	22	8
19	B. S.	F	40	5
20	F. K.	F	20	8
21	H. J.	M	19	7
22	C. B.	F	24	7
23	L. B.	F	25	7

Table III.—Continued

No.	Name	Sex	Age	School Grade
24	B. G.	F	20	8
25	J. R.	M	29	8
26	E. T.	F	33	8
27	M. F.	M	28	8
28	V. R.	F	26	7
29	E. V.	F	25	9
0	W. W.	M	24	8
1	H. D.	M	25	7

These subjects were non-patients, people whom I came across in private life, and who were willing to take the tests. About twelve were taken at an evening school. They were of a similar social status to that of the clinic group; none wealthy, nor very poor—intermediate grades. Their sex, age, and educational status are given in Table III.

These tests were continued on an additional group of patients, five of Hysteria and five of Neurasthenia. The subjects are more fully described in the following table.

Table IV. Additional Subjects

No.	Name	Diagnosis	Sex	Age	School Grade
V. H. 1	M. S.	Hysteria	F	22	8
V. H. 2	R. G.	"	F	24	10
V. H. 3	E. W.	"	F	28	7
V. H. 4	S. K.	"	F	21	10
V. H. 5	S. S.	"	F	24	7
V. N. 1	H. B.	Neurasthenia	M	30	4
V. N. 2	M. N.	"	M	23	6
V. N. 3	M. C. M.	"	M	37	6
V. N. 4	B. S.	"	M	26	5
V. N. 5	T. J.	"	M	33	6

Table V. Summary of Subjects

Group	Number of cases	Sex		Median Age	Median School Grade
		M.	F.		
Neurasthenia	13	11	2	29	6
Add. "	5	5	0	30	6
Psychasthenia	19	10	9	22	8
Hysteria	18	1	17	22	9
Add. "	5		5	24	8
Normal	31	13	18	24	8

Several interesting points appear from this summary:

1. The additional cases gathered for both Neurasthenia and Hysteria do not seem to differ from those first gathered in the general features here given.

2. As to sex, in Neurasthenia, the male sex predominates strongly; in Hysteria, the female sex predominates; and in Psychasthenia, the numbers are about equally divided.

3. The school grade attained by Neurasthenia is below that of the other groups to the extent of two years. All the other groups are about alike.

4. The age of Neurasthenia is more advanced than that of the other groups. The other groups are younger and center about twenty-two. Neurasthenia centers about 29.

CHAPTER III

Comparisons with Normals

The first problem in this study—"How do psychoneurotics as a class compare with normals?"—is to be dealt with in three ways—

1—by ascertaining the median mental ages reached by the group in various of our tests for which fairly reliable standardization of achievement has been obtained by other workers.

2—by comparison with the achievement of a control group of normals.

3—by the amount of overlapping of the psychoneurotic group over the control group.

Table VI

Test	Psychoneurotics Median Mental Age	Q	Normals Med. Ment. Age	Q	Cases
Rote Memory	18	2	18	2.7	16
Substitution	12.6	1.9	14.5	1.3	21
Hard Directions	13.5	2	15	2.3	18
Completion	13.6	1.5	14	1.4	22
Dotting	14.1	2.5	14.6	2.2	14
Number Finding	11.5	2	12.7	.6	26
"A" test	11.5	.9	12.6	3.5	16
Free Association	10.5	2.6	11.8	2	10
Knox Cube	9.	2.8	15.	4.2	11
Marble Statue	10.5	2.3	12	1.8	9
Median	12.		14.3		
P.E.	.53		.45		

Difference between median mental age of Normals and Psychoneurotics—	2.3
Probable Error of this difference	.70

In the above table there is given the median of the mental ages of each group in each test, the Semi-interquartile Range (Q), and the number of cases. In the Psychoneurotic group there were fifty cases, while in the Normal group the number of cases varied for each test. The summary line gives the median of the ten mental ages for each of the groups and the P. E. (t—obt.) of that median. This is obtained by the formula: P. E. t. med. – obt. med. $= \frac{5 \text{ Q dis.}}{4\sqrt{\text{n,}}}$ n being the number of tests.

The P. E. of the difference between median mental ages of normals and psychoneurotics is obtained by use of formula for obtaining the reliability of differences: P. E. (t – obt. Diff. A – B) $= \sqrt{(\text{P. E. t.} - \text{obt. A})^2 + (\text{P. E. t.} - \text{obt. B})^2}$.

The P. E.'s of the medians used in the application of the formula are those given above.

The median mental age may be taken as the central tendency of the "mental capacity" or "intelligence" shown by the two groups in tests that offer sufficiently varied material to bring out high as well as low points.

It is to be observed that the Psychoneurotic group attains a mental age level of 12.0 years while the Normal group attains a level of 14.3 years. The Psychoneurotics are fully 2.3 years below that of the Normals. This difference is over three times as large as its P. E. 0.7.

This is in conformity with the results obtained in the Army[1] tests where the median mental age of the total Army proved to be 13.5 years, and with the results given by Hollingworth.[2] If we take the median of the median mental ages given there for Hysteria, Psychoneuroses (not further classified), Neurasthenia, and Psychasthenia, 11.5, 12.0, 13.0, 14.0 respectively, it is in close agreement with our result, namely, 12.5.

Table VII

Test	Psychoneurotics		Normals			% of psych. reach or exceed	Diff.
	Med. Score	Q	Med. Score	Q.	No.	Med. of Normal	P. E.
Rote Memory	47	4	47	5	16	56%	0
Number Finding	18	4.5	20.5	3	26	44%	3
Dotting	45	7.5	48	6.5	14	42%	1.4
Maze-(time)	77.5	30.0	85	37.5	23	52%	.8
Maze-(accuracy)	1.1	.5	1	1.	23	46%	0
Mixed Relations (acc.)	16	3	16	3	21	52%	0
Trabue Completion	6.1	2	7	1.5	22	46%	2.4
Ink Blots	9.5	3	9.5	1.5	10	52%	0
Marble Statue	23	7	28	3	9	32%	2.6
Knox Cube	6	1	8	2	11	28%	5.0
"A" test	42	4	48	12.5	16	26%	2.4
Free Association	35	10	41	9.0	10	32%	2.0
Hard Directions (acc.)	15.5	1.5	17	2	18	38%	6.0
Mixed Relations (time)	207.5	80	167	57	21	34%	4.2
Hard Directions (time)	282.5	37.5	212.5	45	18	14%	7.0
Memory of Forms	9	3	13	4	21	24%	5.3
Substitution	100	15	85	10	21	28%	3.3

[1]Yerkes, R. M. Army Mental Tests.
[2]Ibid, page 88.

Another means of comparison lies in the varying amounts of overlapping of the psychoneurotic group over the control group in each of the tests. Table VII gives the data for such comparison.

The table gives for the psychoneurotic group and for the control normal group the median score, the semi-interquartile range (Q), the number of cases (for the control group alone—the psychoneurotics had fifty (50) cases), the per cent of the psychoneurotic group reaching or exceeding the median score of the normal group, and the difference between the medians divided by the P. E. of the difference (cf. Table VIII).

The extent of overlapping is seen to have a rather wide range. In some of the tests the two groups are equal in ability, in others they are not, the normal group being superior to the psychoneurotic. On the basis of this overlapping it seems possible to classify the tests into three groups:—

(1) Tests in which the overlapping extends from 14-28%. The tests which fall into this group are Hard Directions (time), Memory of Forms, the "A" test, the Substitution test and the Knox Cube.

(2) Tests in which the overlapping extends from 30-38%. The tests which fall into this group are the Marble Statue, Free Association, Mixed Relations (time), and Hard Directions (acc.).

(3) Tests in which the overlapping extends from 42-56%. The tests which fall into this group are Dotting, Trabue Completion, Number Finding, Maze (accuracy), Maze (time), Mixed Relations (accuracy), Ink Blots, and Rote Memory.

The tests of Group 1 differentiate most the psychoneurotics from the normals, while the tests of Group 3 differentiate least. We may think of Group 1 tests as most disturbing to "nervous stability," those of Group 2 as less and those of Group 3 as least disturbing.

The differential power of these tests may be further checked up by finding the reliability of the difference between the medians of psychoneurotics and the normals. The formula for the P. E. of a difference between two means as given by Whipple[3] was used. This is: $P.E._{DIFF.} = \sqrt{\frac{P.E._1^2}{n_1} + \frac{P.E._2^2}{n_2}}$

The P. E. (median deviation) of the median in each test

[3]Formula 22, page 27, Manual of Mental and Physical Tests.

was found for both the normal and psychoneurotic groups and then the P. E. of their difference as per formula. For the psychoneurotic groups the P. E. was always based on fifty cases but for the normal group the number of cases varied, as indicated in Table VII.

The following table gives the results of the application of the formula to all of the tests.

Table VIII

Test	Diff. bet. med. of Norm. & Psych.	P. E. of Diff.	Diff./P. E.
Substitution	12	3.6	3.3
Knox Cube	1.5	.3	5.0
Rote Memory	0	–	–
Marble Statue	4.5	1.7	2.6
Free Association	6.0	3.05	2.
Hard Directions (acc.)	1.5	.27	6.
" " (time)	7.0	9.3	7.
"A" test	6.	2.5	2.4
Number Finding	2.5	.8	3.
Dotting	3.	2.2	1.4
Maze (time)	7.5	9.7	.8
Maze (acc.)	0	–	–
Ink Blots	0	–	–
Mixed Relations (time)	40.5	9.5	4.2
" " (acc.)	0	–	–
Completion	.9	.38	2.4
Memory Forms	4.0	.75	5.3

For a difference to be reliable it must be at least three times its P.E. We note that not all of our tests show that. The tests which do meet this requirement correspond fairly closely with the grouping made on the basis of overlapping. With the exception of Number Finding, the tests which show a reliable difference do not go beyond an overlapping of 38%. The "A" test does not come up to the expected degree of reliability, the difference between the normal and psychoneurotic group being only 2.4 times it P.E.

We may, therefore, look upon the following tests as of diagnostic significance: Hard Directions (time), and (accuracy), Memory for Forms, Knox Cube, Mixed Relations (time), Substitution, and Number Finding. They definitely differentiate the psychoneurotic from the normal group.

It was found possible to differentiate still more closely between normal and psychoneurotic individuals by means of a team of tests. Such an effective team was found to consist of the Hard Directions (time) test and the Memory for Forms test. Using Q/3 of the normal distribution as the unit, a scale

of steps was obtained for each of the two tests. Each test was then weighted by the value found in Table VII. Thus, the Hard Directions (time) test was weighted by 7, while Memory for Forms was weighted by 5.3. These figures, respectively, are the values found when the difference between the medians of the normal and psychoneurotic group is divided by the P. E. of that difference.

The following scales were drawn up:

Table IX

Memory for Forms					H'd. Directions Time				
Score in Test	Step		wt.	Weighted Score	Score in Test	Step		wt.	Weighted Score
1.3	1	x	5.3 =	5.3	422.5–407.5 sec.	1	x	7 =	7
2.6	2			10.6	407–392.5	2			14
3.9	3			15.9	392–377.5	3			21
5.2	4			21.2	377–362.5	4			28
6.5	5			26.5	362–347.5	5			35
7.8	6			31.8	347–332.5	6			42
9.1	7			37.1	332–317.5	7			49
10.4	8			42.4	317–302.5	8			56
11.7	9			47.7	302–287.5	9			63
13	10			53.	287–272.5	10			70
14.3	11			58.3	272–257.5	11			77
15.6	12			63.6	257–242.5	12			84
16.9	13			68.9	242–227.5	13			91
18.2	14			74.2	227–212.5	14			98
19.5	15			79.5	212–197.5	15			105
0.8	16			84.8	197–182.5	16			112
$\frac{Q}{3}=1.3$					182–167.5	17			119
					167–152.5	18			126
					152–137.5	19			133
					137–122.5	20			140
					122–107.5	21			147
					$\frac{Q}{3}=15$				

When applied to 10 of the normal group, who had taken both tests, the following results were obtained:

Table X

Nu. of Case	Score Mem. Forms (I)	Score H'd. Dir. T. (II)	Weighted Score (I)	Weighted Score (II)	Total w't. Score (I + II)
2	18	200	74	105	179
3	18	200	74	105	179
4	15	360	63	35	98
5	18	310	74	56	130
6	13	175	58	119	177
7	15	215	63	98	161
26	13	190	58	112	170
25	11	140	47	133	180
27	11	240	47	91	138
28	10	330	42	49	91
				Med. Score	165.5

Table XI Results for Abnormal Group

Nu.	Score Mem. Forms (I)	Score H'd. Dir. Time (II)	Weighted Score (I)	Weighted Score (II)	(Total w't.) Score I +II
H3	16	120	68	147	215
H4	7	110	31	147	178
H6	12	190	53	112	167
H13	15	230	63	91	154
H10	14	250	58	84	142
H5	8	245	37	84	121
H17	13	295	58	63	121
H12	13	230	58	91	149
H7	15	300	63	63	126
H11	11	240	47	91	138
H14	10	280	42	70	112
H18	7	187	31	122	153
H1	12	210	55	105	160
H9	9	385	37	21	58
H16	10	276	42	70	112
H2	6	300	26	63	89
H8	13	360	58	35	93
H15	12	300	53	63	116
N12	4	360	21	35	56
N5	3	275	15	70	85
N11	7	278	31	70	101
N10	3	240	15	91	106
N4	15	315	63	56	119
N2	5	330	21	49	70
N8	16	300	68	63	131
N9	1	315	5	56	61
N1	6	420	26	7	33
N7	10	290	42	63	105
N6	10	276	42	70	112
N3	16	220	68	98	166
N13	2	266	10	77	87
P14	9	270	37	77	114
P9	5	390	21	21	42
P5	6	285	26	70	96
P13	3	369	15	28	43
P19	9	300	37	63	100
P7	7	390	31	21	52
P8	6	240	26	91	117
P4	3	300	15	63	78
P11	5	300	21	63	84
P17	8	300	37	63	100
P16	10	370	42	28	70
P15	7	300	31	63	94
P18	8	295	37	63	100
P2	10	356	42	35	77
P6	8	145	37	133	170
P10	12	220	53	98	151
P12	11	195	47	112	159
P1	13	230	58	91	149
P3	20	240	84	91	175

In Table XI are presented the results for the abnormal group. For each individual there is given the raw score in the two tests, the weighted scores, and the sum of the two

weighted scores. Using the median score of the normals as a critical score presents the following overlappings:

12% of the entire psychoneurotic group reach or exceed the critical score.

17% of the hysteric group reach or exceed the critical score.

11% of the psychasthenic group reach or exceed the critical score.

8% of the neurasthenic group reach or exceed the critical score.

It is thus seen that the team of test used serves very effectively to separate the psychoneurotic group from the normal group.

CHAPTER IV

Comparisons of Psychoneurotic Sub-groups

The second problem in this study concerns the sub-groups into which it is customary to divide the psychoneuroses. The question is—"Do mental tests differentiate between neurasthenic, psychasthenic, and hysteric conditions?"

The comparison may be made in terms of "general ability" —the result of lumping together a number of test findings— and in terms of differences in "specific abilities" as shown by specific tests.

Table XII

Median Scores of Sub-groups in Tests

Test	Neurasthenia Median Score	Q	Psychasthenia Med. Score	Q	Hysteria Med. Score	Q
Rote Memory (points)	46	3.5	46.5	3.0	48.5	4.5
Substitution (seconds)	110	9.0	100	15.0	90	11.0
Hard Directions (acc.) (items)	15	2.5	16	2.5	17	1.5
Completion (points)	4	1.5	6	2.	7.5	1.5
Dotting (squares)	37	7.0	44	12.	50.0	11.0
Number Finding (numbers)	15	3.0	18	6.	21.5	4.
"A" test (letters)	41	2.5	44	9.	46.	14.
Free Ass'n.(words)	30	8.0	35	14.5	37.	11.
Knox Cube (groups)	6	1.5	6	1.	7.	1.
Marble Statue (items)	16	5.0	19	7.5	27.	5.
Hard Directions (time) (sec.)	290	27.	300	65.	247	35.
Mixed Relations (time) (sec.)	310	45.	205	68.	170	60.
" " (acc.) (items)	11	3.	17.	2.5	17.	2.5
Maze (time-sec.)	120	96.	75	30.	67.5	23.
Maze (acc.-errors)	1.3	.5	1.3	1.	1.	1.
Ink Blots (number)	7	2.5	10.	4.	12.	3.
Memory Forms (forms)	6	3.5	8.	2.5	11.5	2.5
Number of Cases	13		19		18	

In the preceding table there is given the median score, the semi-interquartile range (Q), and the number of cases for each of the psychoneurotic groups in each of the tests. Each one of the cases took all the tests. In the tests where a time score was used, the lower the score the better the performance. In the other tests a higher score indicated a better performance.

From these median scores it is apparent that the Hysteric group ranks first in mental ability, the Psychasthenic group ranks second and the Neurasthenic group third.

The median scores of the first ten tests given in Table XII can be converted into Mental Age units.

These appear in Table XIII.

Table XIII

Median Mental Ages

Test	Neurasthenia	Psychasthenia	Hysteria
Rote Memory	18	18	19
Substitution	10.8	12.6	14
Hard Directions	13	14	15
Completion	11.5	13.5	14.5
Dotting	10.7	13	15.
Number Finding	10.3	11.5	13.2
"A" test	11.3	11.6	12.2
Knox Cube	9.	9	12
Marble Statue	8.	9	11.6
Free Ass'n	9.5	10.5	11
Median	10.7	12.1	13.6
P. E. med.	0.4	0.6	0.5

Difference between Med. Mental age of Hysteria and Neurasthenia	2.8
P. E.	.64
" " " " " " Psychasthenia and Neurasthenia	1.35
P. E.	.70
" " " " " " Hysteria and Psychasthenia	1.5
P. E.	.77

Table XIII shows a hierarchy of mental ages in which the Hysteria group ranks first, attaining an age level of 13.6 years; the Psychasthenia group ranks second, attaining an age level of 12.1 years; the Neurasthenia group ranks third, attaining an age level of 10.7 years. The P. E. for the median Mental age of each sub-group is obtained by the formula

$$\frac{5\ Q\ \text{dis.}}{4\sqrt{n}}$$

n being the number of tests. The P. E. of the difference between the sub-groups, however, is obtained by the use of the formula: P. E. (t – obt. Diff. A – B) = $\sqrt{(\text{P. E. t} - \text{obt. A})^2}$ $+\sqrt{(\text{P. E. t. obt. B})^2}$

That "intelligence levels" are intimately connected with the type of psychoneurosis developed is a conclusion that is strongly suggested.

A means of judging the distinctness of the Psychoneurotic sub-groups lies through a study of the distributions of the Mental Ages attained by the individuals of each group and the

amount of overlapping of one group over another. The following table gives the data for such a comparison.

Table XIV

Neurasthenia Mental Ages	Psychasthenia Mental Ages	Hysteria Mental Ages
8.1	10.2	10.4
9.5	10.4	11.
10.0	10.5	11.7
10.2	10.7	11.9
10.7	11.2	12.8
10.9	11.5	12.8
11.	11.7	13.1
11.3	11.9	13.2
11.4	12.	13.5
12.3	12.	14.
12.7	12.5	14.2
13.6	12.5	14.8
14.9	12.8	15.2
	14.2	15.6
	14.5	15.9
	14.7	16.7
	15.0	17.6
	15.1	
	16.4	
Med. Ment. Age. 11 Q. 1.0	12—Q 1.6	13.7—Q 1.4
Cases 13	19	18

In table XIV the median mental age of each individual is given for the three sub-groups. There is again evident the hierarchy of mental levels shown in Table XIII.

The correspondence is quite close. The median mental age of Neurasthenics is 11; of Psychasthenics it is 12; and of Hysterics it is 13.7. The semi-interquartile range (Q), is respectively for the three—1.0, 1.6, 1.4. The medians are thus seen not to have a very wide range.

These results differ from those reported by Hollingworth.[4] There the median mental age of Hysteria is given as 11.5—Q. 3.0, of Neurasthenia it is 13.0—Q 2.0, of Psychasthenia the median mental age is 14.0—Q 2.0. This last result cannot be taken with as much reliability as it is gotten from only 10 cases whereas the number of cases for Neurasthenia is 83 and for Hysteria it is 177. There is greater chance for a selective factor to be at work. The variability of Hollingworth's group seems to be greater than in the groups reported, as well as the overlapping.

In the groups here reported the following percentages of overlapping occur:

[4]Ibid, page 88.

30% of the Neurasthenics reach or exceed the Median Mental Age of Psychasthenics

6% of the Neurasthenics reach or exceed the Median Mental Age of Hysterics

32% of the Psychasthenics reach or exceed the Median Mental Age of Hysterics

21% of the Psychasthenics fall as low as the Median of Neurasthenics

11% of the Hysterics fall as low as the Median of Neurasthenics

22% of the Hysterics fall as low as the Median of Psychasthenics

From these percentages it is seen that the Neurasthenic and Hysteric groups are fairly distinct with only 11% of the Hysteric group falling as low as the Median Mental Age of the Neurasthenic group and only 6% of the Neurasthenic group reaching or exceeding the Median Mental Age of the Hysteric group. The Psychasthenic group shows somewhat greater overlapping both towards the Neurasthenic and Hysteric groups. 21% of the Psychasthenic group falls as low as the Median Mental Age of the Neurasthenic and 32% of it reaches or exceeds the Median Mental Age of the Hysteria group.

The overlappings of Hollingworth's groups are more considerable. Working out the percentages from Table III (page 87) where there are given the frequencies of the different Mental Ages for the different groups, I obtain the following results:

45% of Hysteria reach or exceed the Median Mental Age of Neurasthenia

28% of Hysteria reach or exceed the Median Mental Age of Psychasthenia

33% of Neurasthenia reach or exceed the Median Mental Age of Psychasthenia

46% of Neurasthenia fall as low as the Median Mental Age of Hysteria

20% of Psychasthenia fall as low as the Median Mental Age of Hysteria

30% of Psychasthenia fall as low as the Median Mental Age of Neurasthenia

These percentages suggest that the group of Hysteria and the group of Neurasthenia are pretty nearly equal in ability. The group Psychasthenia, too, does not seem to be sharply dis-

tinct from the others as its own median is exceeded to the extent of 28% by Hysteria (the lowest in mental ability of the three groups) and to the extent of 33% by Neurasthenia (second in ability). A greater number of cases than there are (10) would very likely increase the overlapping.

Converting the median scores made by each sub-group into percentile terms brings out very clearly the status of each group. This was done by arranging all the scores made by the whole psychoneurotic group in a test, in a distribution table, turning it into percentiles, and reading off the median score of each sub-group in these percentile terms. We can thus have a means of comparing the three groups in all the tests with the same type of measure. Table XV presents these findings.

Table XV

Median Scores of Sub-groups in Percentile Terms

Test	Neurasthenia	Psychasthenia	Hysteria
Hard Directions (time)	20%	42%	66%
Mixed Relations (time)	20	52	65
Completion	20	45	63
Mixed Relations (acc.)	20	50	50
Maze (time)	22	52	66
Ink Blots	25	50	68
Memory Forms	28	46	73
Dotting	30	48	70
Substitution	32	50	70
Marble Statue	34	50	66
Number Finding	35	50	62
Free Ass'n	40	50	62
Hard Directions (acc.)	40	55	70
"A" test	40	60	70
Knox Cube	40	40	66
Rote Memory	40	50	61
Maze (acc.)	40	40	70
Median Percentile	32 Q 10.0	50 Q 2.5	66 Q 4.0

The Neurasthenia group reaches a median percentile of 32; the Psychasthenic group reaches a median percentile of 50, and the Hysteria group a median percentile of 66. There is thus seen the same hierarchy of mental ability previously brought out.

The comparison of the three sub-groups as to differences in "specific abilities" is a rather difficult matter. That some such differences exist is indicated by the varying percentages of overlapping of one sub-group over another in the different tests. Table XVI gives the percentages of overlapping.

Table XVI

Percentages of Overlapping

NEURASTHENIA PSYCHASTHENIA		NEURASTHENIA HYSTERIA		PSYCHASTHENIA HYSTERIA	
Mixed Relations (time)	0%	Mixed Relations (time)	0%	Memory Forms	16%
Ink Blots	7%	Trabue Completion	7%	Rote Memory	20%
Number Finding	15%	Substitution	7%	Substitution	26%
Mixed Relations (accuracy)	15%	Hard Directions (time)	15%	Ink Blots	26%
Marble Statue	16%	Dotting	15%	Maze (time)	26%
"A" test	23%	Hard Directions (accuracy)	15%	Hard Dir. (time)	31%
Maze (time)	23%	Mixed Relations (accuracy)	15%	Knox Cube	37%
Free Association	30%	"A" test	15%	Free Ass'n	37%
Dotting	30%	Number Finding	15%	Dotting	37%
Substitution	30%	Maze (time)	15%	Marble Stat.	42%
Hard Directions (accuracy)	40%	Memory–Forms	23%	Hard Dir.	42%
Trabue Completion	40%	Ink Blots	23%	Maze (acc.)	42%
Memory–Forms	40%	Free Ass'n	23%	Mixed Rel. (time)	42%
Rote Memory	46%	Rote Memory	30%	No. Finding	48%
Hard Directions (time)	61%	Marble Statue	30%	Trabue Compl.	48%
Knox Cube	70%	Maze (accuracy)	40%	"A" test	52%
Maze (accuracy)	84%	Knox Cube	46%	Mixed Rel. (acc.)	52%

Table XVI indicates the extent to which one group overlaps another in the various tests. Thus, there is a 0% overlapping of Neurasthenia over Psychasthenia in the Mixed Relations (time) test, a similar % for Neurasthenia over Hysteria, but a 42% overlapping of Psychasthenia over Hysteria, etc.

Almost all the tests seem to differentiate between Neurasthenia and Hysteria, indicating that the difference is one of general level largely. This does not seem to be so much the case with the other groups, however. Some tests seem to bring out differences between groups better than others. It is difficult, however, to indicate what percentage of overlapping shows a reliable degree of difference.

A check on the differentiating power of the tests in the three sub-groups by means of the percentages of overlapping is to be had by finding the reliability of the difference between the medians of the sub-groups. The same formula was used

as in the case of the normals and psychoneurotics (Chapter III). The following table gives these results.

Table XVII

Reliability of Difference between Median of Hysteria and Psychasthenia

Test	Difference	P. E. of Diff.	D./P.E.
Substitution	10.00	3.0	3.3
Knox Cube	1.38	.3	4.2
Rote Memory	2.00	1.5	1.
Marble Statue	8.00	2.0	4.
Free Association	2.0	4.2	.5
Hard Directions (acc.)	1.2	1.6	.7
" " (time)	52.5	17.8	3.
"A" Test	1.75	2.1	.8
Number Finding	3.5	1.5	2.3
Dotting	6.0	2.6	2.3
Maze (time)	7.5	6.5	1.
Maze (acc.)	.3	.2	1.
Ink Blots	2.0	.9	2.2
Mixed Relations (time)	35.0	19.7	1.9
" " (acc.)	0.	—	—
Completion	1.25	.62	2.
Memory Forms	3.5	.65	5.4

In the table is given the difference between the medians of the Hysteria and Psychasthenia groups, the Probable Error of that difference, and the number of times the P. E. the difference is. We thus obtain an indication of the degree of reliability that attaches to the various differences, and an indication of the differential power of the test.

We may look upon the following tests as showing a sufficient degree of reliability in differentiating between Hysteria and Psychasthenia: Memory Forms, Knox Cube, Marble Statue, Substitution, and Hard Directions (time). What seems to differentiate the psychasthenic from the hysteric is a deficiency in the memory and learning function and a greater sensitivity to the effect of confusion (as shown by Hard Directions Time), on the part of the psychasthenic. This last test, Hard Directions (time), may also indicate the difficulty for the psychasthenic in making decisions. It thus relates itself to symptomatology, the so-called aboulia. Moreover, the test may serve as a means of differentiating between the aboulia of the hysteric and that of the psychasthenic.

In a similar manner the reliability of the differences between the medians of the psychasthenias and neurasthenias in the various tests was worked out. The results are presented in the following tables.

Table XVIII

Reliability of Differences between Medians of Psychasthenia and Neurasthenia

Test	Difference	P. E. of Diff.	D./P.E.
Substitution	10.0	4.5	2.2
Knox Cube	.3	—	—
Rote Memory	1.0	—	—
Marble Statue	3.0	2.3	1.0
Free Association	5.0	4.0	1.0
Hard Directions (acc.)	.9	—	—
" " (time)	10.0	15.4	.6
"A" test	3.0	1.6	1.9
Number Finding	3.0	.4	7.0
Dotting	7.0	3.2	2.0
Maze (time)	45.0	14.3	3.0
Maze (acc.)	0.0	—	—
Ink Blots	3.0	.87	3.0
Mixed Relations (time)	105.0	22.3	4.7
Mixed Relations (acc.)	6.0	.94	6.3
Completion	2.0	.8	2.5
Memory for Forms	2.0	1.2	1.6

Judging from this table, the tests which show a sufficient degree of reliability in differentiating between psychasthenia and neurasthenia are: Number Finding, Mixed Relations (time), Mixed Relations (acc.), Ink Blots, and Maze (time). The neurasthenic seems to be differentiated from the psychasthenic by a deficiency in associative flexibility (as is indicated by the Mixed Relations test and Ink Blots) and by a perceptual-motor unreadiness (suggested by the Number Finding and Maze tests).

These characteristics are not without suggestive value for symptomatology. The neurasthenic seems to be an individual in whom a 'mental set' operates rather rigidly—an attentiveness and interest in bodily sensations from which it is difficult to distract him and an unreadiness for work rather than an actual fatigue.

Likewise, the reliability of the differences between the medians of the hysteria and neurasthenia groups was found. The results are presented in the following table (XIX).

The tests differentiating Neurasthenia from Hysteria are Mixed Relations (time and accuracy), Ink Blots, Completion, Dotting, Number Finding, Memory for Forms, Marble Statue, Substitution, Maze (time), Hard Directions (time), Knox Cube. The only tests which do not differentiate between Neurasthenia and Hysteria are Rote Memory, Free Association, Hard Directions (acc.), Maze (acc.), and "A" test. The number and variety of the tests differentiating between these two groups seem to indicate that the difference is largely

Table XIX

Reliability of Difference between Medians of Hysteria and Neurasthenia.

Test	Difference	P. E. of Diff.	D./P.E.
Substitution	20.0	4.7	4.5
Knox Cube	1.08	.37	3.0
Rote Memory	2.5	1.6	1.5
Marble Statue	11.0	2.02	4.5
Free Association	7.0	3.4	2.0
Hard Directions (acc.)	2.0	1.7	1.1
" " (time)	42.5	13.3	3.2
"A" test	4.75	2.07	2.2
Number Finding	6.5	1.45	4.7
Dotting	13.0	2.5	5.2
Maze (time)	52.5	13.6	3.7
Maze (acc.)	.3	.2	1.5
Ink Blots	5.0	.8	6.2
Mixed Relations (time)	140,0	21.0	6.6
" " (acc.)	6.0	.9	6.5
Completion	3.25	.6	5.4
Memory for Forms	5.5	1.2	4.6

one of the general mental level rather than in any specific mental process.

In only two tests does the reliability of differences permit differentiating between the Hysteria and the Normal group. These are Hard Directions (time) and Ink Blots. In Hard Directions (time) the difference between the medians of the two groups is 35 seconds, the Normal group being superior, and the P. E. of that difference being 13.3. The difference is 2.6 times its P. E. It is fairly close enough to being three times the P. E. to be regarded as significant. In Ink Blots the difference between the two groups is 2.5 with a P. E. of .75, the Hysteria group being superior. The difference here is 3.3 times its P. E., thus satisfying better the statistical requirement of reliability.

There thus appear for Hysteria two differentiating traits from the Normal. On the one hand there is an aboulia or indecisiveness in the presence of a complex situation such as the Hard Directions test presents with its conditional and alternative stimuli, and on the other hand a superiority in imaginative function. This latter seems to be related to what Janet has pointed out as characteristic of hysteric reactions—their completeness. The hysterical symptoms seem to be ideas, images, suggestions, actions, and neglects carried to ultimate terms.

The Hard Directions Test seems to tap an ability, the absence of which is important in producing neurotic behavior.

Degrees of this ability seem to correlate with test work. What this ability really is, is difficult to state. I have called it an aboulia, or sensitivity to confusion. It might perhaps be better to think of it as an ability which is brought into play in a situation which involves complexity, alternatives, conditional responses, persistence in the face of incongruities, and unusual turns, submissiveness—in all, perhaps what in common parlance goes as "level-headedness"—or still closer as 'balance' akin to 'nervous stability.'

Results from the study of the reliability of differences in the various tests for the different sub-groups indicate:

1—that the difference between hysteria and neurasthenia, on the basis of mental tests, seems to be a matter of general intelligence level, the hysteria group being superior.

2—that a group of tests involving memory, learning, and decisiveness, discriminate between psychasthenia and hysteria, the tests being Memory for Forms, Knox Cube, Marble Statue, Substitution, and Hard Directions (time).

3—a group of tests involving associative flexibility, and perceptual-motor readiness, differentiate between psychasthenia and neurasthenia, the neurasthenia making the poorer score; the tests are: Number Finding, Mixed Relations (time and accuracy), Ink Blots, and Maze (time).

4—that the difference between hysteria and normal group lies in greater fertility of imagery on the part of hysteria as shown by the Ink Blots test and in a more subtle factor tapped by the Hard Directions Test (time), freedom from confusion, 'level-headedness' or stability.

It would appear that associated with a hierarchy of intelligence level there are specific test differences. Associative flexibility, perceptual-motor readiness, learning ability, memory, freedom from confusion, a proper check on imagery—all these go to make up that complex, general intelligence. Deficiencies in these various abilities produce varieties of psychoneurotic behavior. Symptomatology relates itself to test findings, arguing for a constitutional mental basis in the various psychoneurotic patterns.

It was thought desirable to ascertain whether the status of Hysteria and of Neurasthenia would remain unchanged in additional cases. Accordingly five of the original series of tests were selected and given to ten additional cases, five

Hysterias and five Neurasthenias. The tests were chosen with regard to both discriminative capacity and to variety of mental function. The results appear in the following table.

Table XX

Median Scores for Original and Additional Cases.

Test	Original Neurasth.	Additional Neurasth.	Original Hysteria	Additional Hysteria
Completion	4.0	2.0	7.5	8.0
Maze (time)	120.0	150.0	67.5	90.0
Memory Forms	6.0	4.0	11.5	11.0
"A" test	41.0	35.0	46.0	49.0
Mixed Relations (time)	310.0	360.0	170.0	250.0
" " (acc.)	11.0	11.0	17.0	16.0

The difference in mental status of the additional Neurasthenias and Hysterias is as marked as in the original cases. In the Completion test the median score of the additional Neurasthenias is lower than in the original cases, while it is slightly higher for the Hysterias. In the Maze (time) test the new medians show a longer time for both groups, the difference between them, however, is about as great as at first. In Memory for Forms the new median for Hysteria is slightly lower than the first, while for Neurasthenia it is more markedly lower. In the "A" test the new median is slightly higher for Hysteria and about twice as that much lower for Neurasthenia. In the Mixed Relations (time) test the medians for both new groups show a poorer performance than at first, the difference between the new groups being just as marked, however. The medians for accuracy in the same test remain unchanged for Neurasthenia, and very slightly lower for Hysteria. We may conclude that the difference in mental status between Hysteria and Neurasthenia remains unchanged from what it was found in the first group of cases. On the basis of mental tests Neurasthenia and Hysteria are fairly distinct, Neurasthenia having a lower level of intelligence and Hysteria having a level close to the average normal adult.

CHAPTER V

IRREGULARITY OF PERFORMANCE

Attention has been called to the importance attaching to the degree of "scatter" in test scores. This has been variously calculated. Wallin has reported the number of advance credits above the "basal age" as an indication of the tendency to scatter, in his Problems of Subnormality, page 164. Using the Binet-Simon scale in examining defectives, epileptics and insane, he found the scattering more evident among the insane and epileptics.

Pressey,[1] using the Yerkes-Bridges Point Scale in a study especially aimed at the phenomenon of irregularity in test scores, obtained some positive findings. The author describes his method of figuring irregularity as follows: "The basis was a table[2] giving the average score in points of the normal child at each mental age and for each test. Thus, the average score of eleven-year-old children on test one is 3.0; on test two, 3.8; on test three 2.8; on test four 3.7, etc. If a given child, testing at eleven years, scores 3, 4, 5, and 5 on these first four tests, he shows variations from the average, or irregularities, of 0.0, 0.2, 2.2, and 1.3; and the sum of all these variations on all the twenty tests will be the total irregularity."

Pressey has applied this method to a group of dementia praecox cases, a group of chronic alcoholics, a group of normal children, a group of feeble-minded under twenty, and on a group of feeble-minded over twenty. These groups graded from eight through twelve, mental age. The author concludes that feeble-minded children are not distinguished from normal children by greater irregularity, that individuals over twenty show a definitely greater irregularity than do normal or feeble-minded children, that the dementia praecox and chronic alcoholics show greater irregularity than the feeble-minded. Moreover certain tests are differential for the groups.

"The interesting features of the results are the surprising

[1]Journal of Abnormal Psychology, June, 1917, also December, 1918, and February, 1919.

[2]Table 30, p. 123 of "A Point Scale for Measuring Mental Ability." Yerkes, R. M., Bridges, J. W. and Hardwick, R. S., 1915.

difficulty shown by both groups of psychotics in test 16 (drawing the Binet figures from memory) and the marked superiority of these groups over the feeble-minded in test 19 (defining abstract words). The dementia praecox show a distinct, though less striking peculiarity in their slowness of free association; the alcoholics are separated off from the dementia praecox by their more ready response to 'comprehension of questions' and to 'absurdities.'"

Comparing the three groups directly with the normal records to determine "whether the psychotics showed consistent differences, as compared with the feeble-minded, in their variations from the average normal of the same mental age," Pressey found that "the feeble-minded show only one variation over 15 per cent. This is on test 14 (making a sentence containing Boston, money, river); their score is 73 per cent of the normal. On the other hand the dementia praecox give five such variations. They score 77 per cent of normal on test nine (comparisons), 71 per cent on test thirteen (free association for three minutes), 67 per cent on test fourteen, 54 per cent on test sixteen, 138 per cent on test nineteen (definition of abstract words). The alcholics average 129 per cent on test fifteen (comprehension of questions), 77 per cent on test thirteen, 32 per cent on test sixteen, 125 per cent on test seventeen (understanding absurdities), 164 per cent on test nineteen,—again five variations over 15 per cent. The psychotics thus show both more frequent and greater variations from the average normal of the same mental age than do the feeble-minded." (June, 1917.)

In the paper on "Irregularity as a measure of mental deterioration" Pressey gives a norm of 17 points irregularity for the feeble-minded, 20 points for the dementia praecox, and 22 points for the chronic alcoholics. Further work showed the greater irregularity of the psychotic cases to be due largely to an especially greater irregularity on tests 10, 16, 17, 18, and 19 (definition of familiar objects, memory for Binet figures, absurdities, dissected sentences, and definition of abstract words). Of these differential tests a diagnostic "unit" is proposed.

Commenting on these measures of irregularity, Hollingworth[3] states "So far as our measures of irregularity are concerned they are quite in line with those of Wallin and Pressey.

[3]Ibid, page 171, and page 165, Table XVII.

The psychoneurotics show greater irregularity of performance than do the mental defectives, as do also the epileptic, and among the psychoneurotic, only the hysteric exceed the epileptic."

Hollingworth[3] takes as a measure of the tendency to scatter the Average Deviation of the separate test ages from the median mental age. The hysteric group heads the list with an average deviation of 2 years. Then follow the epileptic and concussion groups with an average deviation of 1.8 years, and 1.7 years respectively. Neurasthenia, and the group psychoneurosis (unclassified), vary somewhat less, with an average deviation of 1.4 years, and .9 years respectively.

This heading of the list on the part of the hysteric group assumes more significance in the light of a principle laid down by Pressey. "Marked irregularity seems always to mean interference of some sort with an examination satisfactory for a mental rating. This interference is usually, with psychotic patients, due to deterioration; it may be the result of a more temporary negativism, or retardation, or absorption in a delusional system. It may be the result of physical disease or disability, or of such an ill-proportioned showing as comes from malingering. Whatever the cause irregularity always means that there has been some influence at work which prevents the examination giving a mental age or coefficient which is a satisfactory indication of the patient's normal mental level."

We may best describe this interfering factor broadly as 'fluctuating zeal' or 'fluctuating motivation.' As it is not very probable that hysterics show deterioration of mental functions, we must presume that of the whole group of 'unstables' measured by Hollingworth, the hysterics exhibit 'fluctuating motivation' to the greatest extent. Of all the groups measured, the mental age of hysteria is most interfered with.

Evidence for the sensitivity to motivation is given by Hollingworth in the chapter on The Role of Motivation in the Psychoneuroses. The instrument by which this was measured was Woodworth's Personal Data blank. "It consists of a series of 116 questions, each inquiring into the presence of some more or less common clinical complaint encountered in dealing with the neurotic. Each question is followed by YES-NO, and the patient responds by underlining the answer (either YES or NO) which applies in his case." This Questionnaire was

given to incoming patients (soldiers) before and after the armistice. Previous to the armistice the motivation appeared to be directed to incapacity so as to prevent return to service. After the armistice the motivation was of the opposite sort. It tended towards recovery and return to civil life. In the responses to the questions, tending to affirm or deny complaints, was evidenced the former or latter sort of motivation.

Of these 116 questions 47 were selected as being significant because they were positively reacted to previous to the armstice; they affirmed a disability. They were then classified into three groups: those questions referring definitely to the present condition of the patient as "Do you feel tired most of the time?" those questions referring definitely to matters of historic fact as "Were any of your family ever insane?" and those questions falling in between, referring indefinitely to past or present as "Have your employers generally treated you right?" These groups are for the sake of convenience termed A, B, C, respectively.

The results are truly striking. Treating the frequency before the armistice as 100 per cent, "the frequency falls after the armistice, in all the diagnostic groups, to about 40 per cent, 55 per cent, and 65 per cent in the case of the T, B, C questions respectively. The present condition of patients becomes enormously improved. Not only is this true, but even the facts of their history are more optimistically reported, and intermediate facts are intermediately colored."

Moreover, the various diagnostic groups are not equally sensitive to the influence of motivation. The Hysteric and Psychoneurotic are most sensitive, the Epileptic least, and the Neurasthenic occupies a middle position. In the case of Hysteria, the symptoms given drop to 31, 53, and 45 per cent of those reported before the armistice, in questions A, B, and C respectively. Similarly for the Psychoneurotic (an unclassified group) the figures run 19, 38, and 58 per cent respectively. Neurasthenia shows a drop to 54, 58, and 55 per cent while in Epilepsy the fall is to 58, 66, and 65 per cent. The Hysteric and Psychoneurotic rank first in sensitivity to motivation, the Neurasthenic second, and Epileptic third.

Of interest is the fact that Hysteric and Psychoneurotic show their greatest sensitivity to motivation on questions of group A, whereas the other diagnostic groups show about an equal drop in A, B, and C questions. It will be recalled that

the questions of group A refer to the present condition of the patient. Interpreting this point, Hollingworth states "It is entirely likely that in these conditions (Hysteria and Psychoneurosis) the clinical symptoms manifested by the patient are definitely related to and determined in large degree by his motivation."

Hollingworth's Hysterics thus show themselves lowest in mental age, most irregular in performance, and most sensitive to motivation. The inference that the mental age attained by them is subject to the influence of motivation just as their clinical symptoms are becomes very probable. A check on this inference is the position of the Neurasthenic group. This group occupies a middle place in mental age, a middle place in respect to irregularity of performance, and a similar position in respect to motivation. Applying the same principle as in the case of Hysteria, we would say that the mental age attained by Neurasthenics is less subject to the interfering effect of motivation. The case of Epilepsy presents an interesting variation. In mental age it is lower than Hysteria, in irregularity of performance somewhat lower than Hysteria, but in sensitivity to motivation Epilepsy ranks third. "All that happens to the Epileptic is the general elation of spirits and buoyancy of attitude and evaluation of fact that leads to the apparent improvement of the facts of antecedent history in all of the diagnoses."[4] It would therefore seem in this case that the mental age attained by the Epileptic group is least affected by motivation, the somewhat high irregularity being explained on the basis of deterioration. The likelihood of deterioration in cases of epilepsy is very well known and attested to by all text books in neurology.

The difference in mental level of Hysterics in the Army group of cases and in the Civil group here reported seems explicable on the basis of motivation. The soldiers interpreted and reacted to the mental examination as they did to the physical one. A poor showing meant no "return to duty" just as an unfavorable symptom or complaint would. The possibility of transfer of attitude or of motivation from physical examination, or interview of neurologist, to mental examination seems very great indeed and actually what is to be expected, if the results with the Personal Data blank are to be relied upon.

[4]Ibid, p. 137.

With the Civil cases the situation is totally different. A patient presents himself for treatment of his own volition. He appears most anxious to get well and most ready to cooperate with the examiner. Moreover, if there be some deep-seated motivation productive of the psychoneurosis, it is for the moment in abeyance as it is not directed towards the examiner. In the Army the examiner directly evoked a negative or veiled non-cooperative attitude as he was connected with the patient's destiny.

In the following table is presented the tendency to scatter of the cases here reported. Using the median mental age of each individual as the central tendency, the average deviation of the separate test ages was computed. These were then averaged for each of the groups and the mean variability of that A.D. was then found. For each of the psychoneurotics all ten tests were used. (Cf Table VI.) Of the eighteen cases of Normals, for six cases the variability was based on ten tests, for five cases it was based on nine tests, for one case it was based on eight, for two on six, for one on five tests, and for three on four tests.

Table XXI

Irregularity of Mental Ages

Group	No. of Cases	Average A.D.	Mean Variability of A. D.
Normals	18	1.9	.48
Hysteria	18	1.9	.42
Neurasthenia	13	2.2	.32
Psychasthenia	19	2.3	.43

It appears from this table that the tendency to scatter among normals is the same as that of the group Hysteria. The scatter of the Neurasthenia and Psychasthenia groups is greater than that of normal and hysteric. Of the psychoneurotic sub-groups as a whole, the Hysteric shows the least scatter and the Psychasthenic the most. The Neurasthenic occupies a middle position.

Comparing these results with those of Hollingworth[5] we note that the scatter of the Hysteric group is almost identical. Both show an average deviation of 2 years. The Neurasthenia group here reported shows an increase of .6 of a year. The group reported by Hollingworth has an average deviation of 1.6

[5]Ibid, Table XVII, p. 165.

years while this one 2.2 years. It would seem, again that the Psychoneurotic group here studied shows greater "scatter" to an extent of .4 of a year. This may be explained by the fact that this A.D. is based on ten tests while Hollingworth's is based on five tests.

In order to obtain a finer measure of the irregularity of performance of the individuals based on all of the tests used in this study, the following method was employed: the scores made in each test were transmuted into an 'order of merit,' the rank for each individual in each test was found, then the median of an individual's ranks was taken as the central tendency and the average deviation from that median indicated his irregularity of performance for the whole test series.

The individual average deviations were then averaged for each of the psychoneurotic sub-groups and their variability around a central tendency was calculated. (The measure of this variability was again the A.D.) These measures appear in the following table:

Table XXII

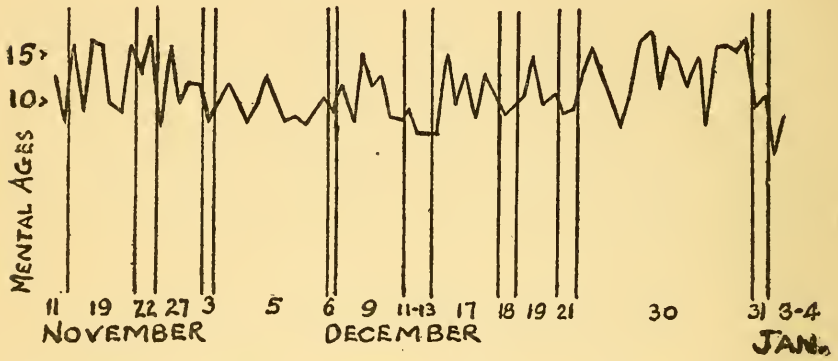
Irregularities of Profile, measured by Ranks.

Group	Cases	Average A. D.	Mean Variability of A.D.
Hysteria	18	8.3	2.05
Neurasthenia	13	8.7	2.0
Psychasthenia	19	9.4	1.6

It is apparent from this table that the hysterics are least irregular, the neurasthenias are slightly more irregular, and the psychasthenias are most irregular of the three groups measured. This is in agreement with the results shown in Table XVIII—Irregularity in Mental Ages. Applying Pressey's principle it would seem that the central tendency in mental efficiency is interfered with, in the three groups, as in the order indicated. This order differs from that found in the group studied by Hollingworth where the hysterics showed the greatest irregularity and neurasthenics were only eighty per cent as irregular. This difference may be accounted for by the greater sensitivity to motivation on the part of the hysterics shown by Hollingworth. The order of irregularity found here argues for no such motivation on the part of the hysterics, but does for a more fluctuating zeal on the part of neurasthenics and psychasthenics.

Desiring to test out whether the group Hysteria actually measured higher in mental tests after the armistice than

before, Hollingworth's original records were consulted. As far as can be made out the actual average of mental ages after the armistice is not higher than that previous to the armistice. Yet the manner in which cases measure high or low in groups at different dates after the armistice is suggestive of motivation. The accompanying graph brings this out clearly. For high mental ages, note the dates of November 19, 22, 27, December 9, 17, 19, 30. For low mental ages note the dates of December 5, 6, 11, 13, 31, January 3, 4.



Distribution of Mental Ages after Armistice—Hollingworth's Data.

The greater variability on the part of Neurasthenia and Psychasthenia seems to have a significance inverse to that of variability in the practice curve. There high variability points towards ultimate higher level; here it points towards lower level. From this viewpoint irregularity of performance becomes an important index of a lowering of mental level, of a tendency towards responses of inferior adaptative value.

The variability of performance and the lowering of mental level found in this study are in agreement with the concept of "psychological tension" set forth by Janet as of fundamental importance in the interpretation of psychoneurotic behavior. According to this concept there is hierarchy of mental functions, superior and inferior forms. When there is an insufficiency of mental energy, a lowering of psychological tension, the responses are of an inferior grade. Closely linked with this is the hypothesis of "derivation psychologique"—substitute responses. When a superior response becomes impossible, inferior ones take its place—agitations, long-drawn out ruminations, anxieties with cardiac and respiratory disturbances.

The following quotations from Janet[6] bring these points out:

"Voici donc un ensemble de recherches qui convergent vers cette idée qu'il y a des degrés de tension psychologique et qu'à ces divers degrés correspondent non seulement des modifications d'intensité mais des modifications très intéressantes de qualité ou de nature dans ces phénomènes. J'ai essayé de les préciser en réunissant ces notions relatives à la tension psychologique avec les faits mis en évidence dans le tableau de la hiérarchie. Le degré de la tension psychologique, ou l'élévation du niveau mental se manifeste par le degré qu'occupe dans la hièrarchie les phénomènes les plus élevés auxquels le sujet peut parvenir. La fonction du réel avec l'action, la perception de la réalité, la certitude exigeant le plus haut degré de tension, ce sont des phénomènes de haute tension; la rêverie, l'agitation motrice, l'emotion exigeant des tensions bien inférieures, on peut les considérer comme des phénomènes de basse tension correspondants à un niveau mental inférieur.

"Bien entendu il est facile de traduire ces hypothèses psychologiques en hypothèses physiologiques: comme je l'ai dit souvent, en dehors des expériences de physiologie et des recherches histologiques proprement dites, les interprétations physiologiques ne sont que les traductions des notions psychologiques en un autre langage.

"Il est bien vraisemblable que cette tension psychologique correspond à une certaine tension physiologique et physique qui existe dans le système nerveux central. On connaît bien des forces physiques présentant des degrés de tension du même genre et déterminant des phénomènes différents suivant leur degré de tension. Quand il s'agit du courant électrique on sait très bien que certains phénomènes ne sont possibles que grâce à une certaine tension du courant. Une lampe donnée ne s'allumera que si le courant a 115 volts; cela ne veut pas dire qu' un courant de 90 volts soit un courant nul. Ce courant inférieur peut être capable de produire d'autres phénomènes, de porter au rouge un fil de platine, de faire marcher un moteur, etc.; mais il ne peut pas allumer la lampe précédente. La chaleur présente des degrés de tension différents suivant la température à laquelle elle s'élève: a 330° elle détermine la fusion du plomb, à 1775° celle du platine. Il doit se passer

[6]Pierre, Janet, "Les Obsessions et La Psychasthénie."

quelque chose d'absolument semblable au point de vue des courant nerveux.

"Malheureusement nous ne savons guère aujourd'hui de quoi dépend cette tension du cerveau. S'agit-il d'une certaine vitesse de vibrations encore inconnues? Y a-t-il un organe spécial chargé des phénomenès de haute tension, tandis que d'autres régions se bornet à l'exécution des phénomènes de basse tension? Est-ce tout le cerveau qui change de tension suivant le cas? D'où provient la régulation de cette tension? Il faut sur tous ces points avouer notre ignorance. Tout ce que nous pouvons conclure, c'est que les modifications de la tension du cerveau vont avoir une importance psychologique énorme s'il est vrai que, comme nous avons été amenés à le supposer dans cette première hypothèse, des catégories de phénomènes psychologiques absolument différents correspondent à différentes tensions. (Vol. 1, pp. 496-7)

"Il faut compléter notre première hypothèse sur l'insuffisance de tension et la suppression des phénomènes supérieurs par une notion qui s'y rattache tout naturellement, celle de la dérivation. Quand une force primitivement destinée à être dépensée pour la production d'un certain phénomène reste inutilisée parce que ce phénomène est devenu impossible, il se produit des dérivations c'est-à-dire que cette force se dépense en produisant d'autres phénomènes non prévus et inutiles. (Vol. 1 p. 555)

"Quand un phénomène psychologique est très supérieur à un autre, la tension qu'il exige pour se produire pourrait être suffisante, si on l'employait autrement, pour produire cent fois le phénomène inférieur. Un courant électrique de 110 volts est nécessaire pour allumer une lampe électrique et il produit ainsi une lumière qui ne nous paraît avoir rien d'excessif. Mais si on appliquait le même courant a des sonnettes, il en ferait marcher quantités et produirait un vacarme. Si on lui faisait traverser des fils métalliques résistants, il les ferait rougir et pourrait déterminer un incendie. Une quantité donnée d'énergie calorique doit être portée à 1800°, c'est-à-dire à un degré élevé de tension pour fondre une quantité minime de platine, si cette même quantité d'énergie n'arrive qu' à la tension de 400°, elle ne pourra plus fondre un milligramme de platine, mais elle pourra facilement fondre des killogrammes de plomb. Nous sommes amenés à admettre de même que la tension psychologique inemployée pour les phénomènes supérieurs qu'elle

ne peut plus produire se dépense en phénomènes inférieurs, et qu'elle donne alors naissance à une véritable explosion de phénomènes infiniment nombreux et puissants, mais toujours inférieurs dans la hiérarchie." (Vol. I, pp. 559-60)

As to the conditions upon which 'psychological tension' depends, there are at present some definite indications. Suggestive in this direction is the participation of the adrenal glands in pain, fear and rage. Again, the association of thyroid activity with the conditions of cretinism and myxoedema points towards the connection of mental torpor and lowering of mental level with endocrine functions. In the variations of endocrine activity may well be the physiological mechanism for the various degrees of psychological tension.

CHAPTER VI

A—INTELLIGENCE AND PSYCHONEUROSIS

In Chapter III, where a comparison between a group of normals and a composite group of psychoneurotics was undertaken, it was shown that the psychoneurotics attained a level in intelligence that was lower than that of normals. Normals tend to reach a mental level of 14 years, while psychoneurotics grade about a 12-year level. This result was furthermore shown to correspond to conditions found in the army, both as to normal and psychoneurotic.

Again, in Chapter IV, it was shown that the sub-groups of psychoneurotics exhibit a hierarchy of mental level, neurasthenics reaching a mental age of eleven, psychasthenics 12, and hysterics 13.6. Mental or intelligence level is thus seen to differentiate between normal and psychoneurotic individuals as well as between different types of psychoneuroses. It is clear, then, that in the concept and fact of mental level there is to be found a clue to the baffling problem of the psychoneuroses.

Attempts at defining intelligence have resulted in emphasis being laid upon various aspects of mental life. Binet, for instance, says: "It seems to us that in intelligence there is a fundamental faculty, the alteration or the lack of which is of the utmost importance for practical life. This faculty is judgment, otherwise called good sense, initiative, the faculty of adapting one's self to circumstances. To judge well, to comprehend well, to reason well, these are the essential activities of intelligence." Ebbinghaus makes intelligence include abstraction and the ability to compare and contrast. Burt says that the result of his work "strongly suggests that it is one feature or function of attentive consciousness which forms the basis of intelligence, namely, the power of readjustment to relatively novel situations by organizing new psychophysical coordinations." Hart and Spearman regard general intelligence as involving a "common factor" or "central tendency," a sort of cortical activity which enters into all varieties of mental activities to a greater or less degree.

A definition of intelligence that has met with wider accep-

tance among psychologists is the one formulated by Stern, "Intelligence is a general capacity of an individual consciously to adjust his thinking to new requirements: it is general mental adaptability to new problems and conditions of life." Intelligence is here given a wide biological setting and a significant role in adaptive behavior.

For the psychoneuroses a similar biological setting has been postulated. They are spoken of as "faulty attempts at adjustment," "defense reactions," "compensatory mechanisms," protective efforts. Such descriptive terms imply that a neurosis is to be looked upon as an attempt on the part of an organism to overcome a difficulty that has arisen in life's course. So, for instance, an hysteric paralysis is looked upon as a reaction of immobility, a defense response met with in lower forms of animal life. So, again, a situation demanding response one way or another, such responses, however, being of an unpleasant character, might be reacted to with an interminable argumentation which leads nowhere but nevertheless serves to delay 'crossing the Rubicon.' Similarly a neurasthenic's aches and general condition of distress may be a response to a situation of not being appreciated or given sufficient attention, the ailment, in turn, arousing the required interest, attention and sympathy.

The connection between a psychoneurosis and an intelligence level now takes on a more definite form. A psychoneurosis is to be thought of as an adaptive response, faulty, because of an inadequate intelligence mechanism. In the face of a difficulty the attempts at adjustment of an inferior intellect result in a psychoneurosis.

Psychoneuroses present, however, all stages and degrees of organization from the full-fledged, unshakeable obsession or phobia to a more or less general apprehensiveness or a feeling that 'all is not right with me,' from a fully established paralysis to an 'I sometimes feel as if I can't move my arm.' Attempts at adjustment seem to run a course, indicate a play of mental activity, and show a fluidity of associative processes that make a psychoneurosis akin to a reasoned product. The thesis here maintained is that a psychoneurotic response is the interaction of a drive with an inadequate intelligence mechanism.

Binet's analysis of the operation of the intelligence mechanism is helpful in understanding its inadequacies. His 'scheme of thought' involves three distinct elements: direction, adapta-

tion, and criticism. Direction refers to the realization of the end to be attained when a task is presented: adaptation refers to the different suggestions and attempts made under the influence of the directing idea or determining tendency: criticism is the tendency to pass judgment on the efforts made, finding them adequate or inadequate in achieving the end desired. In the feeble-minded there is a marked general deficiency in all three elements, rendering them unable to cope with the tasks presented to the average man. In the psychoneurotic the deficiency in these processes is not as great as in the feeble-minded, but it is undoubtedly present as is indicated by their attaining a lower level than normals in the tests given.

It is possible that the deficiency is not shared by all three processes to the same degree; thus, the end in view may be fairly well understood, the varied reactions whether in the form of ideas or overt efforts may be too few, and the critical tendency may be overactive, defeating its own purpose. Some evidence for an overactive critical tendency is to be had from Ruger's[1] work with puzzles. There were subjects in whom this overactive critical tendency was very strong, preventing them from efficient behavior. The critical tendency, however, seemed to be centered on the self rather than on the efforts made, so, that instead of being an aid in adopting or eliminating reactions, it actually limited the number made and prevented success. In my own tests patients frequently voiced doubts as to the adequacy or propriety of their efforts and as to what impression they were making upon the experimenter. Suggestive of the paucity of associations that can be brought to bear upon a problem is the low level attained by the psychoneurotics in the Free Association test—a mental age level of 10.5. This is the familiar three-minute word association activity. Suggestive also of the difficulty in the operations of associative activity is the low level attained in the Substitution test—a mental age of 12.6. Our normal group attained a mental age of 11.8 in the free association test and a mental age of 14.5 in the Substitution test. As for the power to keep in mind the end in view, to grasp the problem, some evidence is to be had in the performance of psychoneurotics in the Hard Directions test. In this test they attain a mental level of 13.5 (scored on the basis of correct responses). This is 1.5 of a year less than the level attained by our normal group.

[1]Ruger, H. A. The Psychology of Efficiency. Archives of Psychology, No. 15.

In a paper on the Psychology of Thinking in the case of Reading, Thorndike[2] proposes a useful concept of the mechanism of errors in thinking. "Elaborate as are the compositions of forces which give thought its final motion and direction, the forces themselves are of simple nature, being elements in situations and connections leading from these elements to responses which use and (in my opinion) satisfying accompaniments have yoked to each element.

"Three simple mechanisms—under-potency and over-potency of elements, dislocation or disrelation of elements, and wrongness or inadequacy of connections—seem to be all that are needed to explain errors in thinking. Conversely, proper balance and organization of elements and right bonds therewith seem to explain correct thinking, no matter how elaborate or subtle. Thinking and reasoning do not seem to be in any useful sense opposites of automatism, custom, or habit, but simply the action of habits in cases where the elements of the situation compete and cooperate notably.

"It is of course the case that, along with the balanced action of elements, there goes an inspection and validation of them and the ideas or acts they evoke, whereby each succeeding situation is often amended by increasing or reducing the potency of certain of its elements, and whereby certain futile ideas may be cast away entirely. These welcomings and rejectings, retainings and letting go, are, however, themselves nothing more than situation-response bonds, where the response is attending to or turning from, cherishing, repeating, saying no or yes to, or the like. It is also the case that the "set" or adjustment of the organism plays a more striking role in reasoning than it does in mere day-dreaming or routine habit-action, but not a different sort of role.

"I conclude, therefore, that the general laws of human behavior which explain why a pupil puts his clothes on or off and eats or leaves uneaten his breakfast, explain why he succeeds or fails in making geometrical demonstrations or scientific researches, and that there exists no fundamental physiological contrast between fixed habits and reasoning."

These very same laws will explain why one develops a psychoneurosis and one does not.

The three mechanisms to which Thorndike calls attention—under-potency and over-potency of elements, dislocation of

[2]E. L. Thorndike—The Psychology of Thinking in the Case of Reading. Psychol. Review, Vol. 23, p. 220.

elements, and wrongness or inadequacy of connection—certainly play an important part in psychoneurotic thinking.

Of special import is the factor of potency. Ideas, trends, feelings assume a striking potency in psychoneurotic behavior. In fact, it is quite possible to make this factor of potency of elements the 'center of gravity' in such behavior. This has been done in the doctrine of the 'complex.' Hart[3] defines a 'complex' as a "system of connected ideas, with a strong emotional tone, and a tendency to produce actions of a certain definite character." Stated in terms of potency a 'complex' is a system of ideas emotionally toned that either intrinsically possesses or takes on an undue potency which carries it rough-shod over all the obstacles that 'the rest of the personality' can set before it. It expresses itself either 'directly' or 'indirectly,' that is to say, baldly in terms of its actual content or in a more or less veiled fashion seemingly unconnected with the actual situation. It would appear that the 'indirect' form of expression is favored in the psychoneuroses.

Although the doctrine of the complex is undoubtedly of suggestive value, it smacks too much of a molecular conception of mental behavior, to be truly descriptive. A complex is too often regarded like a neat little packet of ideas and stored up energy, a 'logic-tight' compartment. Usually it is strongly held in check by a sense of 'how-shocking' so that it avoids frank expression and seeks devious 'symbolic paths.' Though never perhaps so specifically stated, familiarity with psychoanalytic doctrines will bear out the above statement.

What the 'molecular conception of mental behavior' fails to pay due heed to, is the inner organization of the 'molecule.' Just as molecular physics has uncovered in the molecule and atom a structure and play of forces, so psychological analysis discovers a structure and manifestation of the laws of human behavior in the organization of the 'complex'—a flow of associative processes in which elements cooperate and compete, attach and detach themselves, forming connections which can be judged as more or less adequate from the standpoint of an 'end.'

An actual case that has been studied affords an insight into the nature of a psychoneurosis. The patient presents herself with the complaint that she is obsessed with thoughts and fears of death. She has thoughts of what is going on under-

[3]Bernard Hart—The Psychology of Insanity.

ground, sees skeletons, ruminates over the process of disintegration, imagines herself similarly placed, thinks of how people will miss her, is overwhelmed with feelings of self-pity, gets a choking sensation in her throat, thinks she is suffocating and is thrown into a paroxysm of fear.

The history of the neurosis is extremely suggestive. It dates back to her first pregnancy. Her folks and husband were very solicitous over her, took from her all useful and distractive household duties. In the absence of the thoughts and plannings that household duties involved, she was constantly driven to thoughts of her own condition, the possible dangers involved, doubts and fears as to whether she would survive. Following the birth of her child, with the new duties imposed upon her, she turns back to normal behavior.

Then follows another pregnancy and a miscarriage, with a several weeks' stay in bed, aggravated by a severe attack of indigestion. Thoughts of death, strongly intensified by her condition, recur to her. They become linked up with memories of her mother who died eight years ago. To cap the climax a recently married sister-in-law dies of septicemia. She had visited her frequently, had noted all the horrible features and incorporated them into her train of thought. After unsuccessful attempts at treatment she presents herself at the clinic with a full-fledged anxiety neurosis, involving a general state of apprehensiveness, obsessive preoccupation with thoughts of death, and attacks of fear during which she thinks herself at the point of death.

Following psychotherapeutic efforts patient began to improve, but again had a relapse. This relapse occurred before and after a visit to the cemetery. The visit and the planning for it served to re-arouse a state of psychoneurotic behavior.

We have in this case a good illustration of our thesis that a psychoneurosis is the interaction of a 'drive' with an 'intelligence mechanism.' The patient's 'sense of security' is interfered with by a condition of pregnancy; there is a doubt in her mind as to the outcome. In the 'associative play' that follows, the notion of death assumes an undue potency, because of its vivid character, the frequency with which it occurs, and the under-potency of such associations as the ordinary routine of life brings. With the successful termination of her pregnancy, the thoughts of death lose their validity. Associations dealing with new problems of child-welfare and housekeeping

become potent and the neurosis disappears. The second pregnancy, its unsuccessful termination, the attack of severe indigestion, again interfere with the 'sense of security'; the problem of survival again arises. Her own condition being much severer, the details of her sister-in-law's death making a very vivid and intense appeal to her, the notion of death and its elaborations become over-potent and the patient reacts with the psychomotor, glandular, and vascular 'manifestations' of fear. We thus see the factor of over-potency and under-potency of associative elements as productive of a faulty mode of thinking—an obsession. Dislocation or disrelation of elements may be seen in associating details of her sister-in-law's death with herself. Inadequacy of response lies in the unserviceableness of the obsession and phobia for life's purposes. The psychoneurosis here examined exhibits the very same mechanisms that were found to be productive of erroneous thinking before.

All in all it is the product of an inferior 'intelligence mechanism,' understanding by that the ability to select more serviceable responses in a difficulty. A better 'intelligence mechanism' would have either reduced the potency of the idea of death by a process of criticism, invalidation of it, recognition of its unserviceableness, making such recognition over-potent, or by making active efforts at obtaining distractive influences. It is owing to the failure of the psychoneurotic to do these things that the belief has grown up that he cherishes these symptoms. Rather does it indicate a failure to appreciate the situation, a failure to understand how it all came about although they are in as full possession of the facts as the therapist, a failure to cast about for means of escape, a deficiency in 'trial and error' ability.

Most psychotherapy reduces itself to the patient's telling his story and the therapist's retelling it to him. The therapist supplies the neurotic's deficiencies, shows him where his difficulty lies and suggests to him a more sensible way out. Psychotherapy depends for its efficiency on the therapist's intelligence.

B—CHARACTER OF PSYCHONEUROTIC INTELLIGENCE AS SHOWN BY CORRELATIONS

An indication as to the character of the intelligence shown by psychoneurotics is to be had from the study of the correla-

tions found between the tests given. Table XXIII gives these. They were obtained by means of the "rank-difference" formula of Spearman where $r = \frac{6\Sigma D^2}{N(N^2-1)}$

Table XXIII gives the correlations that obtain among the various tests. An indication of the reliability of the tests is to be had from the correlation between a group of tests which have been standardized as to age and the rest of the tests used in this study. The tests which have age norms are the "A" test, Rote Memory, Marble Statue, Knox Cube, Free Association, Substitution, and Hard Directions (Accuracy). By means of the median rank of subjects in these tests and their median rank in the remaining tests I was enabled to correlate them. The formula used was the same as previously mentioned. This gave a correlation of .75 with a P. E. of .041.

To obtain the correlation between the various tests and the central tendency in intelligence, the median mental age was determined from the seven above-mentioned tests, then turned into an 'order of merit,' and correlated with the 'order of merit' that obtained in each of the other tests. The results appear in the last line of table XXIII, under the heading Median Mental Age.

The order in which the abilities shown in the specific tests correlate with the measure taken as the intelligence level is: Substitution .73, "A" test .69, Hard Directions (Accuracy).66, Free Association .66, Mixed Relations (time) .54, Hard Directions (time) .53, Mixed Relations (accuracy) .52, Ink Blots .52, Completion .50, Marble Statue .49, Memory for Forms .47, Knox Cube .46, Number Finding .46, Dotting .43, Maze (time) .43, Maze (accuracy) .43, Rote Memory .39.

Grouping the tests in terms of their correlation with mental age level we note that Substitution, "A" test, Hard Directions (acc.) and Free Association rank highest. With the exception of Hard Directions (acc.) these might all be characterized as tests of simple association. Next in order come a group of tests that might be regarded as involving selective thinking; the reaction called for is one of a possible number. These tests are Mixed Relations, Hard Directions (time), Ink Blots, Completion. Following these we have a group of tests that come under the heading of Memory tests; these are in order, Logical Memory (Marble Statue), Memory for Forms, Knox Cube. Then come a group of tests that might be described as tests

Table XXIII
Correlations

	Dot-ting	"A" Test	Nu. Find	Rote Mem.	Mem. Forms	Marb. Statue	Knox Cube	Ink Blots	Free Ass'n	H'd Dir. Time	H'd Dir. Acc.	Mixed Rel. T.	Mixed Rel. Ac.	Comple-tion	Substi-tution	Maze Time	Maze Acc.
Dotting		50	55	22	29	0	13	18	34	44	29	14	28	45	49	50	18
"A" Test	50		49	18	31	14	06	28	41	57	44	44	45	32	58	31	18
Nu. Finding	55	49		57	31	13	27	51	46	10	41	36	31	48	40	54	13
Rote Memory	22	18	57		21	13	36	40	22	48	28	42	21	39	25	21	09
Mem. Forms	29	31	31	21		51	44	34	45	34	46	39	34	27	38	32	40
Marb. Statue	0	14	13	13	51		40	41	18	24	38	35	46	36	18	28	20
Knox Cube	13	06	27	36	44	40		37	16	28	25	22	25	20	38	26	41
Ink Blots	18	28	51	40	34	41	37		60	29	35	46	28	33	32	45	04
Free Ass'n	34	41	46	22	45	18	16	60		47	46	50	36	32	47	44	21
H'd Dir. time	44	57	10	48	34	24	28	29	47		40	55	44	43	49	24	27
" " acc.	29	44	41	28	46	38	25	35	46	40		44	44	42	45	22	38
Mix. Rel. time	14	44	36	42	39	35	22	46	50	55	44		67	40	44	38	17
" " acc.	28	45	31	21	34	46	25	28	36	34	44	67		50	41	38	28
Completion	45	32	48	39	27	36	20	33	32	43	42	40	50		49	45	27
Substitution	49	58	40	25	38	18	38	32	47	49	45	44	41	49		42	59
Maze time	50	31	54	21	32	28	26	45	44	24	22	38	38	45	42		41
" acc.	18	18	13	09	40	20	41	04	21	26	38	17	28	27	59	41	
Med. Ment. Age	43	69	46	39	47	49	46	52	66	53	66	54	52	50	73	43	43

of a perceptual-motor-readiness character: these are Number Finding, Dotting, Maze. Least, of all the tests, in correlation with intelligence seems to be Rote Memory (memory for concrete, unrelated words).

Considering the correlations of just the tests of the composite used, we note that the following order occurs: Substitution .73, "A" test .69, Free Association .66, Hard Direction (Accuracy) .66, Marble Statue .49, Knox Cube .46, Rote Memory .39. This is in close agreement with the order found above.

For people in general, Simpson[4] obtains a different order from the one found here. "The average correlation of each test with the eleven other tests is: Hard Opposites .60, Ebbinghaus Completion test .58, Memory of Words .56, Easy Opposites .53, "A" test .50, Completing Words .47, Memory of Passages .44, Adding .43, Learning Pairs .41, Geometrical Forms .40, Estimating Lengths .26, Drawing Lines .13.

"Grouping the related tests we have:

Average correlation of Selective Thinking with other tests .59
Average correlation of Memory with other tests 50
Average correlation of Association with other tests (exclusive of Learning Pairs) inclusive 48
Average correlation of Perception with other tests 45
Average correlation of Motor Control with other tests 26
Average correlation of Discrimination of Lengths with other tests 19

"Using the argument from correlation alone, power of selective thinking is more intimately connected with, and more characteristic of, general mental ability than is any of the other abilities tested; memory is next most highly correlated with general ability; the simpler forms of association next; perception next; motor control considerably less; and discrimination of lengths least of all."

The order found by Simpson differs from mine in that selective thinking ranks first, memory second, simple association third, perception fourth, motor control fifth. My order is: simple association first, selective thinking second, memory third, perceptual-motor fourth.

Suggestive, also, in this direction are the correlations found by Pintner in a Non-Language Group Intelligence Test[5]. Two

[4]Ibid, pp. 66-67.
[5]Journal of Applied Psychology, Sept., 1919.

tests, an easy and a more difficult substitution test, give the highest correlations with the total score on the whole series of tests for the children, while two other tests involving analytic or selective thinking, a reversed drawing test and a picture reconstruction test, give the highest correlations for the adults, a group of university students.

At age 9, Pintner obtains these correlations between each test and the total score on the whole series of tests: Imitation (on the order of the Knox Cube) .78, Easy Substitution .83, Hard Substitution .84, Drawing Completion .76, Reversed Drawing .67, Picture Reconstruction .65. At age 12, the correlations run respectively, .67, .78, .80, .50, .50, .56. For the university students, the correlations are respectively, .36, .44, .45, .41, .66, .66. For ages 9 and 12, tests of simple association are more intimately connected with general ability than are tests of analytic or selective ability. The reverse relation holds for the group of adults.

It would appear, therefore, that grades of intelligence below the average normal adult are characterized as better connective or associative mechanisms than selective or analytic mechanisms. To state the fact in terms applicable to our study, psychoneurotic thinking is more likely to proceed in a connective manner than in a selective manner.

C—Other Concepts of the Psychoneuroses

Attempting to differentiate between normal and abnormal responses, Hollingworth[4] proposes the concept of redintegration. This he defines "as that type of process in which a part of a complex stimulus provokes the complete reaction that was previously made to the complex stimulus as a whole." "The normal type reacts to the part in the light of its contextual relations; the hypomanic tends to react prematurely to details that are insufficiently developed to reveal their present relevance; the feeble-minded fail to comprehend total situations and the relational or contextual features of details; the 'dementia praecox' type exhibits an undue perseveration and insistent readiness of a particular system or redintegrative pattern with the resulting predisposition toward fixed and stereotyped response, systematic delusion, postural automatism and emotional inflexibility; the psychoneurotic tends to respond not so much to an insufficient detail, but rather to an irrelevant, but outstanding detail, and to this detail in its own

character or in its earlier setting, rather than as determined by the nature of the present context."

In this last case, Hollingworth[6] looks upon it as a defect in 'sagacity' which he follows James in characterizing as a 'perception of essence.' To quote again, "Sagacity is, then, the ability to comprehend properly the part in its relation to the whole and to discriminate out of a whole the appropriate, relevant, or significant detail. Failure in sagacity will thus imply a disposition to react to a present total situation by singling out some detail of it and reacting to this detail by some total reaction previously associated with a whole in which the detail figured as an item. This is the mechanism of the psychoneuroses. If we may accept the analysis of James, whereby reasoning or intelligence involves the two essential features of sagacity and learning, it is not unfair to suggest that just as the feeble-minded are conspicuously lacking in the latter function, the psychoneurotic are deficient in the former.

"Because of this lack of sagacity, the psychoneurotic becomes dizzy on hearing an opera air, vomits at the mention of a man's name, is sickened at the sight of a flower stem, is fearful and anxious in the presence of a church tower, displays mental anorexia on the sight of a loved one's place at table, stammers again at the appearance of a medical examiner, is thrown into violent tremor at the sound of the fire alarm, and re-establishes a paralysis or contracture when ordered to bayonet practice or to fatigue duty."

The concept of redintegration which reduces psychoneurotic behavior to a 'connective' form of response, receives support in the conclusion reached from our correlations. These showed tests of simple associative character more closely related to the intelligence of psychoneurotics than tests calling upon a 'selective' ability. The reverse seemed to be the case for higher levels of intelligence.

In a wider sense, however, the concept of redintegration does not seem sufficient to explain the entire character of psychoneurotic behavior. It leaves out the facts of motivation, the dynamic aspect of 'mental set.' This insufficiency is brought out by Hollingworth himself in the chapter on "The Role of Motivation" under the question "How is the therapeutic effect of changed motivation to be understood?" The suggestions

[6]Ibid, Chapter IV.

there made clearly reveal the importance of motivation both in the production and removal of psychoneurotic symptoms, and the inadequacy of the theory of redintegration alone. The suggestions are quoted:

"In the first place the stimulating detail has commonly been an element in several contexts. A change in motivation, with its attendant shifts of attention and plans for the future, brings to readiness redintegrative patterns other than the particular one responsible for the symptom. Thus the sound of a gun is not only a part of the battle experience; it is equally a detail of the hunting expedition, the shooting gallery, the Fourth of July celebration. The armistice, with its attendant adjustments, through the suggestion of return to civilian occupation, brings into cortical, postural and autonomic readiness entirely different sets of responses, so the original symptoms, if entirely "functional" or redintegrative in character, may disappear.

"In the second place some portions of the symptom picture may be due to exaggeration, capitalization, and similar mechanisms. Change in motivation removes or reduces this element and only the more fixed and crystallized features survive. Instances are not lacking in which the desire for compensation on the ground of disability leaves the capitalization motive active. In such cases the symptoms may be expected to survive the armistice.

"In the third place it follows, in part from the facts included in the first suggestion, that a change in motivation changes also in an essential way the perceptual nature of many stimuli. Thus the military camp is no longer a step on the way to war, but, instead a point of demobilization, a step on the way home. It is then essentially a different stimulus. The surgeon is no longer the one who certifies one as fit for duty, but is now the official who certifies one as eligible for honorable discharge. Since the perceptual nature of the stimulating detail changes in such radical fashion, a corresponding change in the response it redintegrates is quite to be anticipated."

From these suggestions it would appear that the perceptual nature of a stimulus, its ideational ramifications and overt responses are dependent upon the motivation. The distinction between normal and psychoneurotic redintegration falls away; the one or the other is a result of the way one is motivated.

Furthermore there appears to be a wider scope to the intellective process that the motivation activates than is covered by the idea of redintegration-total response to partial stimulation.

The concept that a psychoneurosis is the interaction of a drive with an inadequate intelligence mechanism seems to be more satisfactory when these points are taken into consideration. It involves a 'drive' aspect—motivation, and a complex of mental processes that come under a generalization of 'intelligence.' True, our study of test correlation shows that tests of simple 'connective' character are more closely associated with a central measure of intelligence—the median mental age, but tests of 'selective thinking' also correlate with the median mental age and the correlation is a significant one although not as high as the other. We may reasonably conclude that psychoneurotic thinking is not wholly a 'connective' response. There is an interplay of 'connective' and 'selective' response. The product, however, is inferior as an adaptive response to what higher mental levels are capable of.

Furthermore, this manner of conceiving the matter throws considerable light on the psychology of psychotherapy. Essentially, psychotherapy is a process in which the therapist arouses in the patient a drive 'to be convinced,' subjects his mental contents to a critical evaluation, and suggests a solution which comes from a superior intelligence level. The interplay of 'connective' and 'selective' action results in a product which is superior as an adaptive response. Although correlation studies, previously quoted, indicate that tests of 'selective thinking' are more closely related to higher grades of intelligence than are tests of 'connective ability,' still, we cannot speak of such a product as wholly a 'selective' response. It has its 'connective' features too.

Closer examination shows the theory of 'redintegration' and that of 'drive interacting with inferior mental level' as supplementary to each other. The latter throws considerable light on the general mental condition upon which psychoneurotic conduct depends, while the former provides the modus operandi for the recurrence of psychoneurotic responses. Again, the process of recovery, involving an understanding on the part of the patient of the unserviceableness of the symptoms, and a willingness toward recovery, is followed by redintegrations of a more normal order. In these two supplementary concepts the 'psychoneurotic constitution' is linked up

with normal behavior, and is given a definite, measurable character.

The relation of these two theories to Janet's concept of Psychological Tension and Derivation appears to be particularly close. Janet's formula seems to be a more generalized manner of stating the facts of inferior intelligence level, consequent inadequate and unserviceable redintegrations, irregularity of performance. These are more precise formulations, call attention to more specific features of psychoneurotic response and tend to single out more definite processes for investigation.

It is of interest to note that Janet himself has observed the relation of variations in psychological tension to age. The following quotation indicates it:

"Il sufit de rappeler ici quelques exemples bien connus de cette oscillation pour pouvoir appliquer cette notion à notre problème. En premier lieu, il est probable que ces variations de tension psychologique jouent un grand rôle dans les modifications mentales produites par l'âge. La puissance d'adaptation au réel, très petite dans l'enfance, s'accroît dans la jeunesse et baisse dans le vieillesse: on connaît l'aboulie, la distraction, l'amnésie continue des vieillards." (Vol. 1, p. 498).

It is but a step further to consider variations of psychological tension as age or intelligence levels.

This viewpoint of intelligence level, further, is in harmony with Janet's theory in differentiating between hysteria and psychasthenia. The mental age in hysteria, according to the present investigation, tends to run close to that of normals. For hysteria the median mental age is found to be 13.6, while for the normal group it is 14.3. There isn't then the lowering of mental level as in the case of Psychasthenia and Neurasthenia where the mental level is 12.1 and 10.7 respectively. Janet presents a similar characterization. The hysteric suffers from a narrowing of the field of consciousness, tending to concentrate all his energy and readiness upon a specific point, while the psychasthenic responds as from a general lowering of mental tension, and diminution of superior functions.

Psychoanalytic concepts pay little heed to the intellectual factor and so do not relate themselves readily to the theory of "drive interacting with inadequate intelligence." There is, however, a concession to its importance in the fact that psychoanalysts do not advise analysis unless the patient is in-

telligent. In other words a suitable degree of intelligence conditions the therapeutic success of psychoanalysis. An adequate organization of conscious processes that fall under the heading of 'intelligence' is required in order to correct the neurotic's errors of thinking and unserviceable behavior. It may therefore be concluded that if good intelligence conditions successful therapy, then poor intelligence conditions psychoneurotic conduct. This is evidenced both by Hollingworth's results and those of the present study.

The psychoanalytic idea of 'infantilism' points in a similar direction. If an adult's maladjusted behavior is to be explained on the ground of reactions and habits formed in childhood, then their very persistence argues for a lack of adjustment power, for an inability to modify reactions, for an inadequate intelligence throughout the individual's career.

This last point makes clear a matter that has always been obscure. Psychoanalytic theories have never clearly explained why, when all individuals seem to go through a similar course of development, only some become 'fixated' at lower stages and later develop neuroses, while the greater majority make healthy adjustment and do not develop neuroses. On the theory of intelligence levels these facts become clearer. The individuals who develop neuroses have made inferior interpretations of and adjustments to situations throughout all their lives because of a faulty intelligence.

It is of interest to note that Janet treats the 'Freudian etiology' in similar fashion. The 'Freudian etiology' bases neurasthenia upon excessive masturbation or frequent pollutions, anxiety neurosis upon incomplete satisfaction of sexual needs, and hysteria upon unconscious memories relating to sexual life, and referring back to infancy. Janet points out that even in masturbation, coitus reservatus, coitus normal, these persons could find a sufficient satisfaction, if they were normal; these insufficiencies of the sexual emotion are only a manifestation, a particular case of their psychological insufficiencies. The passage from Janet follows:

"Si j'admets les faits signalés par M. Freud et M. Tournier, je suis disposé à les interpréter d'une tout autre façon. Même dans le masturbation, même dans le coit réservé, et à plus forte raison dans le coit normal, ces personnes pourraient trouver une satisfaction suffisante *si elles étaient normales.* Mais elles ne le sont pas et ces insuffisances de l'émotion

sexuelle ne sont qu'une manifestation, un cas particulier de leurs insuffisances psychologiques. C'est parce qu'elles deviennent de plus en plus incapables de pousser un phénomène psychologique jusquà son terme qu'elles s'arrêtent à moitié chemin dans cette émotion comme dans les autres" (p. 623).

It is clear then that psychoneurotic behavior is an expression of mental insufficiency involving with it psycho-physical coordinations of an inferior order, motor, vascular, glandular, visceral; that sexual inadequacies take their place in the totality of symptoms, not ranking superior to forced agitations, mental ruminations, anxieties, fears, obsessive ideas, compulsions, automatisms, as inferior and unserviceable responses.

Jung comes closer to this view-point in his reduction of psychoneurotic behavior to interferences with a general 'life urge' and consequent regressions. We must add however that there exists in psychoneurotics a fundamental constitutional insufficiency of psychological tension, tending to the production of responses that are of lower adaptability than those of normals.

Attention is here called to the generality of this 'life urge,' which thus allows room for other than sexual factors. If we take from it its metaphorical, mystical, and metaphysical character and insist upon interpreting it in the 'hard' common sense terms of experimental, biological psychology, it acts as a valuable corrective of psychoanalytic doctrines, and brings them closer to the psychological view point of mental level in relation to situation-response.

CHAPTER VII

SUMMARY AND DISCUSSION OF RESULTS

The present study may be briefly summarized as follows:

1. Mental tests serve to differentiate between normal and psychoneurotic groups and between psychoneurotic sub-groups; moreover they serve to characterize the 'fundamental psychoneurotic constitution' in a more definite and measurable manner than the fanciful 'mechanisms' and anecdotal methods of psychoanalysis.

2. The tests here used show that psychoneurotics attain a median mental age of 12, while normals grade at 14.3.

3. There is an hierarchy of intelligence level in the psychoneurotic sub-groups, Neurasthenia reaching a level of 10.7, Psychasthenia of 12, and Hysteria 13.6.

4. Certain of the tests show sufficiently reliable differences between the medians of one sub-group and another, between the normal group and the psychoneurotic group as a whole, to justify their use for purposes of differential diagnosis. Moreover they suggest a correlation between test behavior and varieties of psychoneurotic behavior.

5. Irregularity of performance in psychoneurotics is slightly greater than in normals, and varies within close limits among the sub-groups. The measure used was the A. D. from the median mental age. Normals have an A. D. of 1.9 years, Hysteria of 1.9, Neurasthenia 2.2, and Psychasthenia 2.3 years. When irregularity was measured by means of average deviation from median rank the sub-groups maintain the same order. Irregularity of Performance seems to relate itself to Janet's concept of lowering of psychological tension.

6. The findings in regard to intelligence suggest that the fundamental mechanism in the psychoneuroses is the interaction of a drive with an inadequate intelligence mechanism. This together with Hollingworth's concept of redintegration clarifies psychoneurotic behavior, reducing it to clear-cut psychological terms.

7. This inadequacy of intelligence mechanism appears from a study of the correlations to be the predominance of 'connec-

tive' over 'selective' thinking. This serves as a useful characterization of the 'psychoneurotic constitution.'

8. Psychotherapy is to be thought of as essentially a process of arousing in the patient a 'sense of security,' a willingness to be convinced, a critical evaluation of his mental contents, and the suggestion of solutions that come from a superior mental level.

Criticism of these results may be raised at the following points:

1. Are these results conditioned by sampling?
2. How are psychoneurotics of high mental level to be accounted for?
3. How are these results related to the general finding that among Army officers, presumably a superior group, psychoneuroses tended to be of the neurasthenic and psychasthenic type?
4. Is inadequate mental level to be regarded as cause or effect of the psychoneurosis?
5. How does motivation affect the performance of civil cases?
6. Revision of definition in light of the above points.

The results of a limited number of measurements always raise the question as to whether the sampling is fair, whether it is truly representative. At first thought it may appear that patients who present themselves at a clinic for treatment represent a lower social stratum. In the present case, however, there were influences at work which tended to raise this stratum so that it was fairly representative of the average level. Of such influences, the reputation of the institution is of considerable importance. People come to it, not merely because of its public character, but also because of the reliability attached to its efforts. Physicians frequently send their private cases for further diagnosis and treatment. Then again, patients come, not only from the congested sections, but also from outlying sections of the city, from Long Island and New Jersey. Besides, the fees charged, though not exorbitant, are nevertheless effectively prohibitive of extensive use to individuals of lower social strata. For these reasons it seems that the sampling was fairly representative of the average social level. A further check on this is the agreement of the median mental age of the total psychoneurotic group with that of Hollingworth's Army group.

Allied to this question of sampling is the occurrence of 'neurasthenia' or neurotic tendencies in individuals of high levels of intelligence. Such occurrences suggest that besides the factor of intelligence there are others which tend to interfere with the full activity of the intelligence possessed by an individual. Closer attention to the 'drive' aspect is suggestive in that direction. Drives or motive forces may have all degrees of intensity, may vary in their power to call forth a number of subsidiary or conflicting impulses. In individuals of high levels of intelligence it is very likely that drives or motives ramify more widely, touch off a greater variety of subsidiary and conflicting tendencies, and thus interfere with the usual high level responses.

A case in point is that of E. L., one of the patients here studied, a case of Anxiety Neurosis, who obtained a high intelligence rating, 16.4 years. The patient, a young woman of nineteen, about to complete her final term at High School, lives with an old mother and feels keenly the fact that instead of helping to support her mother, she is an additional burden. The difficulty is increased still further when the source of support and the conflicts associated with it are revealed. It appears that her brother, who is the main support of her mother and herself, has forsaken the religion of his fathers and has adopted a new one. With people of the Jewish faith this is a matter of keen feeling, hurt pride, and intense resentment. The family and the old mother have been terribly shaken by this event. For the patient, the matter is a source of constant irritation, for while the rest have given him up, she has set herself the task of winning him over again. The situation is becoming more hopeless daily. She is in utter despair as she realizes that her efforts are in vain. To cap the climax, the patient is dependent on his earnings, which take on the character of tainted money, as the young man works for the Missionaries. To refuse to take the money would be to break the only point of contact she has with him. In taking it she does violence to her finer sentiments. Back of it all there is the real need for it. Another brother has given cause for worry and shame by his adopting a career of delinquency. Again there is a conflict. There is outraged family pride, fear that his deeds may come to light, despair at what the future holds in store for him. She cannot permit herself to adopt the solution of just casting him off, and yet her finer

feelings revolt at his doings. The intensity and ramifying character of her conflicts are thus seen. Moreover the motivation seems to be of a finer sort than is usually found in lower levels of intelligence.

As the case is studied, one cannot help but feel that the patient is not using her intelligence level to its best advantage. It was fairly easy to suggest to her a broader point of view, a more objective mode of viewing the situation, and a reduction of her tenseness. It is very likely that what occurs in psychoneurotics of high intelligence level is that they do not use that level. Some situations, the drives and motives that they arouse are of such intensity and complexity that they prevent the full operation of their superior intelligence level.

Another suggestion is that individuals of high level intelligence are exposed to a higher range of motives, feel keenly issues that would have little weight with individuals of low intelligence. An instance of this may be seen in the case of Army officers in the recent War who developed psychoneuroses. It was found that these generally tended to be of the neurasthenia-psychasthenia type rather than hysteria. The explanation may be that they were engaged in mental conflicts of a superior sort. Duties, responsibilities, the desire to win the war, personal ambitions, pride, all these interfered with the acceptance of an 'hysteric' device of functional paralysis, tremor, aphonia, or sensory loss, which catered to the more elemental motive of escape from a dangerous situation.

Rivers[1] traces the fact of the greater frequency of neurasthenia among officers and hysteria among men to a difference in training and military duties. "The conclusion is that the private soldier is especially apt to succumb to that form of neurosis which closely resembles the effects produced by hypnotism or other form of suggestion because his military training has been of a kind to enhance his suggestibility. The officer, on the other hand, is less prone to this form of neurosis and falls a victim to it only when there is some organic injury which acts as a continuous source of suggestion. On the other hand, the officer is especially liable to anxiety neurosis (neurasthenia) because the nature of his duties especially puts him into positions of responsibility which produce or accentuate mental conflicts set up by repression, thus producing states of anxiety, the form taken by his nervous disorder."

[1] "War Neurosis and Military Training," Mental Hygiene, October, 1918

Hollingworth, finding in his study a higher mental level for neurasthenia than for hysteria, suggests that "It is indeed entirely possible that the correlation between anxiety neurosis and responsibility on the one hand and between somatic disorders and enhanced suggestibility on the other hand, is only the superficial statement of a single fact—the dependence of the clinical picture on the intelligence level of the individual. The very factor that predisposes the private soldier toward hysteric symptoms is also the factor that originally determined his military status and his failure to receive a commission. Officers are commissioned because of just that degree of intelligence which predisposes them toward the anxiety picture." (pages 115-116).

Hollingworth's own figures, however, do not point unequivocally towards correlation of high mental level with neurasthenia and psychasthenia. Thus, in his Class III, a group identified with distinctly subjective or mental symptoms —the psychasthenic group, 43 per cent had an intelligence level lower than 13. In Class II, consisting of individuals who showed both physical and mental symptoms—the doubtful or transitional group, apparently of the neurasthenic order, 68 per cent had an intelligence level lower than 13. If both classes are included, 58 per cent fall below the 13 year level. (Table VI, page 106).

In the Civil group here reported, 75 per cent of the neurasthenia and psychasthenia cases, taken together, fall below a mental age level of 13, while 25 per cent are above. It would appear, therefore, that cases of neurasthenia and psychasthenia are contributed to by individuals of both lower and higher grade, the ratio in an unselected civil group being 3:1 and in an Army group close to 3:2 in favor of the lower level.

This preponderance of lower mental level among psychoneurotics raises an issue as to the causal relation of inadequate intelligence to psychoneurosis. Does the lower level of intelligence represent the effects of a neurosis? Or are individuals psychoneurotic, because with their lower level of intelligence they understand situations imperfectly, respond to irrelevant features, jump at unwarranted conclusions such as obsessions and phobias, do useless ruminating, keep themselves needlessly stirred up, and accept solutions of inferior adaptative value which they permit to become inflexible?

A good deal of psychoneurotic behavior seems to be ex-

plicable on the basis of this alternative, the factor of conflict as previously considered rendering the smaller number of neurotic individuals of high level incapable of acting up to their level. The first alternative, lower intelligence level the effect of a neurosis, is, however, a possibility and deserves consideration. It may be that an individual lacking in energy, applying himself listlessly to tasks that he meets in life, constantly hesitating, delaying reactions, comes in time, out of mere unreadiness, to fail to take in all details of a situation, to judge properly, to think coherently, to attend and to remember poorly, to learn slowly and control associations inadequately—in short, comes to respond with a lower mental level.

Evidence of a fairly direct nature, however, would seem to oppose the hypothesis of deteriorated level. If it be true that psychoneurotics present a deteriorated mental level, it must be conditioned by chronological age. There should be greater deterioration in men aged 40, than in those aged 30, or 20. For from all indications, psychoneurotic behavior is not just an acute condition. Though there may be periods of greater severity, such behavior is generally of long standing. In line with this is the fact that Hollingworth found 65 per cent of 836 cases of psychoneuroses had had the condition "prior to enlistment." The chances are that the older a man is the longer he has had the neurosis and the more pronounced the effect on mental level.

Such an effect on mental level, however, is not the case, at least, only to a very limited extent. Hollingworth, in a study of 534 psychoneurotics ranging in age from 18 to 45, finds "the evidence is that up to the age of 40 or 45 years attentive apprehension and general mental alertness do not change as a function of chronological age, but learning capacity changes in definite and measurable degree, the relation between age and learning capacity being an inverse one." Learning capacity refers to that ability tested by the Substitution Test (Woodworth-Wells), attentive apprehension tested by Digit Span, and general alertness tested by Completion, Opposites, and Word Building.

It appears, therefore, that mental level is not lowered as a function of chronological age, and by inference, as a function of long-continued psychoneurotic behavior. The fact of decrease in capacity for forming new associations is of consid-

erable importance for understanding symptoms, their inflexibility, and difficulties in the therapeutic process.

It seems, moreover, possible to reduce the psychoneurotic constitution to a more specific form than general mental level. This was rendered possible by the finding that certain of the tests differentiated one sub-group from another and the total psychoneurotic group from the normal group. The use of two such tests, Memory for Forms and Hard Directions (time), as a team, proved to be very effective in separating the psychoneurotic group from the normal. The critical score used gave the following overlapping:

85% of the hysteric group fall below the critical score,
89% of the psychasthenic group fall below the critical score,
93% of the neurasthenic group fall below the critical score,
88% of the total psychoneurotic group fall below the critical score.

If it is remembered that the general mental level of 13 proved to be the dividing line for 75 per cent of the cases of neurasthenia and psychasthenia, for 33 per cent of the cases of hysteria, and 60 per cent of all cases, the superiority of this team of tests as a differentiating unit, and as characteristic of the psychoneurotic make-up becomes evident.

A question that may be raised in evaluating the results of these tests is whether the low-level performance of neurasthenics and psychasthenics, here reported, can be explained on the basis of motivation as it explained the large shift in the case of hysterics. Two factors would seem to operate against such an interpretation, the differing degrees of sensitivity to motivation on the part of the various sub-groups and the difference in direction of motivation in the Army and Civil groups. Hollingworth's study of the Role of Motivation showed that the different sub-groups of psychoneurotics exhibited different degrees of sensitivity to motivation, Hysteria being most sensitive, Psychasthenia much less sensitive, and Neurasthenia least sensitive. The shift in cases of Neurasthenics and Psychasthenics could not, therefore, be as much a matter of motivation as in the case of Hysteria. Then again, in the Civil group, the behavior of patients, their voluntary, earnest and continued search for aid suggests a motivation in the direction of health. The examination under such conditions would therefore favor a truer diagnosis of mental level.

These two factors, the desire to attain health and the lesser degree of the tendency to simulation, render the low-level performance on the part of neurasthenics and psychasthenics a reliable measure.

A partial explanation of the discrepancy between my results and those of Hollingworth may however be found in the greater role of motivation in the performance of the hysterics, as compared with the neurasthenics and psychasthenics. In the nervously broken-down soldier, motivation tending to depress performance would lower the performance of hysterics more than of the other types; whereas in the civil clinic, motivation directed towards health would tend to keep the hysteric patient up to his (or rather her) true level. Thus we might expect hysterics to compare more favorably with neurasthenics and psychasthenics, in civil than in the special war conditions.

Together with considerations of mental level, specific profile, conflict, there appear to be some general conditions which act as precipitating factors in psychoneurotic behavior; as, unsatisfying work, marital infelicity, dissatisfaction with social status. Instances of these are readily met with in clinical practice. Of course, it may well be the other way, a psychneurotic constitution conditioning dissatisfaction with work, with social position, with marital state. There seems to be no doubt of a vicious circle operating. A psychoneurotic make-up paves the way for dissatisfactions and difficulties in adjustments and these in turn exert a depressing influence on the individual, rendering him still more incapable of making a proper adjustment.

Breaking in upon this vicious circle by changing occupation may be a valuable measure. For it is conceivable that certain types of work are more suitable for maintaining balance than others. Thus work in which results are immediately seen is better than work in which the results are too far off in that it involves less suspense. Again, work that has variety and not too much of a routine character is valuable in that it makes a constant call for attention and does not give much opportunity for indulging in ruminations of a personal sort.

Hygienic living is another factor that contributes to mental health and constitutes an approach in therapy, partly because of improved physiological 'tone' and partly because of better mental 'tone' evidenced in motivation towards health, definite

attention to set tasks instead of to personal matters, a more objective point of view, and the confidence that comes as improvement comes.

Now then, it has become fairly evident that mental balance is rarely a matter of a single factor. In cases of mental defect, intelligence level alone is an insufficient determinant. Social and industrial efficiency are criteria of utmost significance. Emotional and volitional qualities are to be considered along with intelligence in making out a case for inferior adaptative capacity. A similar situation would seem to hold in the case of psychoneurotics. The definition previously given of a psychoneurosis as the interaction of a drive with an inadequate intelligence level does not exhaust the totality of factors. However, regarded as a core about which are grouped other factors: characteristic mental profile, conflict, motivation, social, occupational and hygienic difficulties, it appears to be productive of a better understanding of the psychoneuroses, their origin, development, and therapy. Further experimental investigation will undoubtedly bring to light more detailed factors of mental structure and function involved in the psychoneurotic constitution and its overt expression.

TABLE XXIV

Scores of Psychoneurotic Subjects

Name	Number	Subst.	Knox Cube	Rote Mem.	Marb. St.	Free Assn.	Hard Dir.Ac.	Hard Dir. Time	"A" Test	Nu. Find.	Dot-ting	Maze Time	Maze Acc. Err.	Ink Blot.	Mixed Rel. T.	Mixed Rel.Ac	Trabue Compl.	Mem. Forms
M.U.	H 1	122	5	52	25	21	16	210	46	22	70	150	3	4	185	18	9	12
J. McF.	H 2	115	6	40	29	37	16	300	39	18	46	45	4	13	210	17	6	6
J. W.	H 3	55	11	56	27	63	19	120	66	30	50	45	0	13	75	20	12	16
A. B.	H 4	65	9	56	31	52	20	110	78	23	59	50	1	17	65	19	10	7
G. B.	H 5	85	6	57	26	62	19	245	38	25	52	50	1	17	90	17	8	8
F. S.	H 6	75	8	50	37	35	19	190	54	33	50	55	1	17	240	13	9	12
S. G.	H 7	85	8	43	26	42	17	300	46	15	53	55	0	7	175	18	6	15
A. S.	H 8	90	8	37	15	27	14	360	37	15	48	57	0	11	300	16	5	13
M. H.	H 9	100	8	44	21	25	12	385	38	22	70	65	1	13	400	13	6	9
B. L.	H10	84	6	45	40	44	18	250	57	15	50	66	1	4	180	19	9	14
E. R.	H11	80	7	56	37	54	14	240	40	15	32	69	0	13	110	19	12	11
A. T.	H12	90	8	50	29	48	17	230	59	21	45	71	2	15	110	13	4	13
A. S.	H13	84	9	61	37	37	18	230	48	25	50	75	0	10	140	18	8	15
E. G.	H14	100	6	45	27	36	15	280	57	23	37	80	2	12	180	20	6	10
J. J.	H15	147	6	36	27	52	18	300	30	15	25	115	2	4	300	12	7	11
S. E.	H16	106	6	48	14	37	16	276	44	14	40	145	2	12	160	14	6	10
R. A.	H17	104	8	47	40	25	17	295	41	15	40	100	2	12	120	16	9	13
O. G.	H18	94	7	49	20	26	15	187	46	23	63	95	2	7	165	16	7	7
J. H.	P 1	92	6	47	35	54	17	230	46	26	57	26	1	27	270	14	8	13
M. C.	P 2	80	5	42	14	54	15	356	57	17	54	42	2	7	257	15	8	10
E. L.	P 3	65	10	47	37	52	18	240	48	27	60	45	1	13	125	18	10	20
D. G.	P 4	105	6	50	23	23	9	300	44	27	57	50	3	10	335	11	10	3
M. M.	P 5	127	5	47	14	50	11	285	39	14	39	60	3	12	120	18	4	6
R. N.	P 6	75	7	57	12	40	16	145	53	26	50	60	1	10	140	18	8	8
J. K.	P 7	107	7	42	18	36	16	390	37	15	39	70	2	9	290	15	9	7
J. S.	P 8	104	6	44	7	36	12	240	45	24	57	70	1	3	200	13	4	6
I. H.	P 9	100	5	36	19	19	17	390	42	14	45	75	1	3	230	17	4	5
J. B.	P10	95	5	50	31	35	18	220	49	28	44	75	2	17	135	20	12	12
R. G.	P11	115	11	48	23	20	17	300	35	22	32	86	1	9	265	17	5	5
W. H.	P12	85	7	48	19	57	15	195	40	36	63	90	4	14	170	19	9	11
E. K.	P13	101	6	34	26	21	14	369	46	14	28	205	4	14	205	16	3	3

Table XXIV (cont.)

Name	Number	Subst.	Knox Cube	Rote Mem.	Marb. Stat.	Free Assn.	Hard Dir. Ac.	Hard Dir. Time	"A" Test	Nu. Find.	Dot-ting	Maze Time	Maze Acc. Err.	Ink Blot.	Mixed Rel. T	Mixed Rel. Ac.	Trabue Compl.	Mem. Forms
V. H.	P14	120	7	48	29	33	9	270	33	15	23	240	5	7	225	11	0	9
S. G.	P15	85	6	46	33	20	16	300	43	11	23	135	1	4	155	19	6	7
J. A.	P16	115	7	47	46	30	15	370	38	14	45	120	2	11	540	17	6	10
M. H.	P17	100	6	54	13	35	17	300	39	18	37	105	2	11	120	15	8	8
P. L. S.	P18	105	5	36	15	54	20	295	44	25	35	105	1	8	165	18	6	8
W. G.	P19	100	5	46	11	21	13	300	46	18	40	90	2	1	300	9	4	9
E. G.	N 1	125	5	46	15	30	14	420	41	18	30	120	2	7	320	14	7	6
A. M.	N 2	128	6	50	27	18	15	330	37	15	29	40	2	9	240	15	7	5
W. G.	N 3	110	7	42	45	47	16	220	66	23	39	60	1	17	125	18	4	16
Ph. S.	N 4	117	9	55	22	38	10	315	30	18	26	75	2	16	180	8	1	15
J. S.	N 5	110	3	36	5	22	11	275	38	12	50	95	0	4	250	12	6	3
J. G.	N 6	125	7	56	11	34	18	276	41	23	50	97	2	9	320	11	6	10
J. I.	N 7	95	9	50	16	35	16	290	42	15	37	120	0	7	310	14	3	10
H. T.	N 8	94	6	35	29	25	16	300	37	11	34	145	1	7	300	10	4	16
J. Q.	N 9	110	7	46	24	30	15	315	42	13	40	155	5	6	300	17	4	1
T. S.	N10	95	9	41	16	14	7	240	37	14	21	170	1	2	420	10	8	3
A. K.	N11	130	6	42	4	30	14	278	44	10	45	300	6	8	480	10	3	7
J. G.	N12	263	3	48	15	13	12	360	20	14	22	300	2	4	360	6	2	4
H. F.	N13	81	4	47	14	56	17	266	56	21	48	290	2	13	390	7	5	2
								ADDITIONAL CASES										
H. B.	VN1								23			200			300	8	2	7
M. N.	VN2								38			130			405	10	4	6
M. C.	VN3								41			160			470	17	8	4
B. S.	VN4								26			105			180	12	2	4
T. J.	VN5								35			150			360	11	2	4
S. S.	VH1								49			73			230	16	7	11
R. G.	VH2								52			95			280	16	8	11
E. W.	VH3								41			65			270	13	8	4
S. S.	VH4								61			190			190	16	10	14
S. S.	VH5								35			90			250	16	7	13

TABLE XXV—Scores for Normals

Name	Number	Subst.	Knox Cube	Rote Mem.	Marb. Stat.	Free Assn.	Hard Dir. Acc.	Hard Dir. Time	"A" Test	Numb. Find.	Dot-ting	Maze Time	Maze Acc. Err.	Ink Blots	Mix. Rel.T.	Mix. Rel.Ac.	Trabue Compl.	Mem. Fms.
L. S.	1	110							61	27					85	17	6	11
C. G.	2	75					17	200				45	1				12	18
F. T.	3	80	9	49	28	58	16	200	65	23	51	35	0	16	145	19	8	18
C. L.	4	75	8	47	23	62	13	360	70	22	50	85	1	6	135	15	7	15
I. C.	5	75		42	27		18	310	47	31	50	150	5		155	17	10	18
I. C.	6	78	9	47	36	43	18	175	64	20	41	230	3	11	270	16	8	13
E. G.	7	60	9	50	32		18	215	69	30	55	65	1		82	18	7	15
J. S.	8			40	25		14				55	55	0					
M. T.	9						20	205	68	21							10	
I. V.	10									18		85	3		190	18	9	7
R. M.	11									14		170	2		260	12	6	14
E. P.	12									27		135	2		400	10	2	20
M. S.	13									24		60	0		330	14	8	10
E. S.	14									20					185	20		6
H. B.	15	115								20								7
L. H.	16	95								18								14
R. D.	17	85								23								6
G. D.	18	200								22								-3
B. S.	19			34			8	275		16	30				400	12	2	
F. K.	20	128	4	39		25	17	390	36	11	20	185	3	8	365	13	4	
H. J.	21	80	8	36		53	17	210	42	18	41	65	0	10	165	8	7	
C. B.	22	100	5	48		31	12		31	16	40	90	3	9	170	8	2	
L. B.	23	138	5	40	23	38	14	285	43	18	46	87	0	15	207	10	6	
B. G.	24	92	6	53		38	15	195	39	25	40	125	2	10	150	13	5	
J. R.	25	85	7	54	30	35	18	140	49	25	53	40	0	8	90	19	10	11
E. T.	26	90	8	50	33	47	18	190	49	17	56	37	2	7	120	17	6	13
M. F.	27	75		50			17	240	39	17		150	1		170	20	12	11
V. R.	28	87		40			12	330	42	23		90	0		145	19	8	10
E. B.	29	75										62	0					
W. W.	30											35	0					13
H. D.	31											50	0					

Table XXVI—Mental Ages of Normals

Case Nu.	Subst.	Knox Cube	Rote Mem.	Marb Stat.	Free Assn.	Hard Dir'n.	"A" Test	Nu. Find.	Dott- ing	Trabue Compl.	Med M. A.	Aver. Dev.
1.	10.8						18	16.5		13.5	15	2.2
2.	15.5					15				20		
3.	15	17	18	12	18	14	18	14	11.4	15	14.7	2.0
4.	15.5	15	18	10.5	18	10.5	18	13.5	11.6	14	14.5	2.4
5.	15.5		14	11.6		16	12	18	11.6	18	14.7	2.3
6.	15.2	17	18	18	12.2	17	18	12.5	14.8	15	15.6	1.7
7.	17	17	18	15.5		16	18	18	10.7	14	16.7	1.5
8.			12.5	11		11.5			10.7		11.2	.9
9.						18	18	13		18	15.5	2.5
10.								11.5		16		
11.								10		13.5		
12.								16.5		9.5		
13.								15		15		
14.								12.5				
15.	10.5							12.5				
16.	13.1							11.5				
17.	15.5							14				
18.	6.8							13.5				
19.			9.5			7		10.7	16	9.5	9.5	2.0
20.	9.7	6	12		8.5	15	10.2	8.6	17	11.5	10.2	2.5
21.	15.	15	10		15	15	11.5	11.5	14.8	14	14.8	1.4
22.	12.4	7	18		9.6	9.5	9	10.6	15	9.5	9.6	2.2
23.	9.1	7	12.5	10.5	11.2	11.5	11.6	11.5	14	13.5	11.4	1.4
24.	13.6	9	18		11.2	13	11	15.5	15	12.5	13	2.0
25.	14.5	12	18	13	10.5	16	12.8	15.5	11	18	13.7	2.3
26.	14.	15	18	17	13	16	12.8	11	10.6	13.5	13.7	1.9
27.	15.5		18			15	11	11		20	15.2	2.9
28.	14.3		12.5			9.5	11.5	14		15	13.2	1.7
29.	15.5											

Table XXVII—Mental Ages of Psychoneurotics

Case Nu.	Subst.	Knox Cube	Rote Mem.	Marb Stat.	Free Ass'n	Hard Dir'n	"A" test	Nu. Find.	Dot- ting	Trabue Compl.	Med. M. A.	Aver. Dev.
N1	9.9	7	17.5	7.7	9.5	11.5	11.3	11.5	11.6	14	11.4	1.8
N2	9.7	9	18	11.6	7	13	10.5	10.3	11.4	14	10.9	2.1
N3	10.8	12	14	18	13.2	14	18	14.4	14.3	11.5	13.6	1.8
N4	10.4	17	18	10.2	11.2	8.5	8.6	11.5	10.8	8.5	10.7	2.2
N5	10.8	5	10	7	7.6	9	10.7	9	15.7	13.5	9.5	2.3
N6	9.9	12	18	7	10.3	16	11.3	14	15.7	13.5	12.7	2.6
N7	13.1	17	18	8	10.5	14	11.5	10.3	14.3	10.5	12.8	2.5
N8	13.3	9	9.7	12.5	8.5	14	10.5	8.6	13	11.5	11	1.8
N9	10.8	12	17.5	10.7	9.5	13	11.5	9.5	14.8	11.5	11.3	1.5
N10	13.1	17	13	8	7	6	10.5	10	9.2	15	10.2	2.8
N11	9.5	9	14	6	9.5	11.5	11.8	8.3	15.5	10.5	10	2
N12	6.2	5	18	7.7	6	9.5	6.5	10	9.8	9.5	8.1	2.5
N13	14.9	6	18	7.5	16	15	15	13	15.7	12.5	14.9	2.5
P1	17	9	18	18	15.3	15	12.2	16	15.9	15	15.1	1.8
P2	15	7	14	7.5	15.3	13	15.3	11	16	15	14.2	2.4
P3	16.5	18	18	18	14.6	16	12.6	16.5	16.3	18	16.4	1.3
P4	12.1	9	18	10.5	8	8	11.8	16.5	16	18	11.9	3.3
P5	9.7	7	18	7.5	14	9	11	10	14.3	11.5	10.5	2.6
P6	15.5	12	18	7	11.6	14	14	16	15.7	15	14.5	2.1
P7	11.5	12	14	8.6	10.7	14	10.5	16	14.3	10.3	11.5	1.8
P8	12.2	9	16	6	10.7	9.5	12	15	15.9	11.5	11.7	2.4
P9	12.6	7	10	9	7	15	11.5	10	15.5	11.5	10.4	2.3
P10	13.1	7	18	14	10.5	16	12.8	17	15.4	18	14.7	2.7
P11	10.5	18	18	10.5	7.2	15	10	13.5	11.6	12.5	12	2.7
P12	14.5	12	18	9	17	13	11.1	16.5	15.4	16	15	2.3
P13	12.5	9	9.5	11.3	7.5	11.5	12.2	10	11	10.5	10.7	1.2
P14	10.2	12	18	12.5	10	8	9.5	10.3	10	10	10.2	1.5
P15	14.5	9	17.5	17	7.2	14	11.6	8.7	10	13.5	12.5	3.0
P16	10.5	12	18	18	9.5	13	10.7	10	15.5	13.5	12.5	2.5
P17	12.6	9	18	7.2	10.5	15	11	11.5	14.3	15	12	2.6
P18	12.1	7	10	7.7	15.3	18	11.8	15.5	14	13.5	12.8	2.7
P19	12.6	7	17.5	7	7.5	10.5	12.2	11.5	14.8	11.5	11.2	2.5
H1	10	7	18	11	7.5	14	12.2	13.5	16.6	16	12.8	3.0
H2	10.5	9	12.5	12.5	11	14	11	11.5	15.5	13.5	11.7	1.5
H3	17.5	18	18	11.6	18	17	18	18	15.6	18	17.6	1.1
H4	16.5	17	18	14	14.6	18	18	14	16.2	18	16.7	1.3
H5	14.5	9	18	11.3	18	17	10.7	15.5	15.9	15	15.2	2.0
H6	15.5	15	18	18	10.5	17	14.3	18	15.8	16	15.9	1.0
H7	14.5	15	15	11.3	12	15	12.2	10.3	16	13.5	14	1.6
H8	14	15	10.5	8	9	11.5	10.5	10.3	15.7	12.5	11	2.3
H9	12.6	15	16	10	8.5	9.5	10.7	13.5	16.6	13.5	12.8	2.3

Table XXVII.—Continued

Case No.	Subst.	Knox Cube	Rote Mem.	Marb Stat.	Free Ass'n	Hard Dir'n	"A" test	No. Find	Dot-ting	Trabue Compl.	Med. M. A.	Aver. Dev
H10	14.6	9	17	18	12.5	16	15.3	10.3	15.7	16	15.5	2.1
H11	15	12	18	18	15.3	11.5	11.1	10.3	11.6	18	13.5	2.8
H12	14	15	18	12.5	13.5	15	16	13	15.5	11.5	14.2	1.5
H13	14.6	17	18	18	11	16	12.6	15.5	15.7	15	15.6	1.6
H14	12.6	9	17	11.6	10.7	13	15.1	14	14.3	13.5	13.2	1.7
H15	8.6	9	10	11.6	14.6	16	8.6	10.3	10.5	14	10.4	2.0
H16	12	9	18	7.5	11	14	11.8	10	14.8	13.5	11.9	2.2
H17	12.2	15	18	18	8.5	15	11.3	10.3	14.8	16	14.8	2.4
H18	13.3	12	18	9.5	8.7	13	12.2	14	16.7	14	13.1	2.0

BF 21 A7 no.60 40918

Tendler, Alexander D.
The mental status of psychoneurotics.

Date	Issued to

PSYCH

BF21
A7
no.60

Tendler, Alexander D 1893-
The mental status of psychoneurotics by Alexander D. Tendler. New York, 1923.
86 p. diagr. 25 cm. (Archives of psychology ... no. 60)

40918

PSYCH

MENU 26 MAY 77 2995783 NED7bp 24-301

ARCHIVES OF PSYCHOLOGY

Sub-Station 84, New York City

In addition to the numbers of the Archives, the following monographs are to be obtained from us:

Measurements of Twins: EDWARD L. THORNDIKE. 50 cents.
Avenarius and the Standpoint of Pure Experience: WENDELL T. BUSH. 75 cents.
The Psychology of Association: FELIX ARNOLD. 50 cents.
The Measurement of Variable Quantities: FRANZ BOAS. 50 cents.
Linguistic Lapses: FREDERIC LYMAN WELLS. $1.00.
The Diurnal Course of Efficiency: HOWARD D. MARSH. 90 cents.
The Time of Perception as a Measure of Differences in Sensations: VIVIAN ALLEN CHARLES HENMON. 60 cents.
Interests in Relation to Intelligence: LOUISE E. POULL. $1.00. Reprinted from *Ungraded.*
The Conditioned Pupillary and Eyelid Reactions.: HULSEY CASON. $1.00. Reprinted from the *Journal of Experimental Psychology.*

THE JOURNAL OF PHILOSOPHY

Sub-Station 84, New York City

Published on alternate Thursdays

$4 PER ANNUM, 26 NUMBERS 20 CENTS PER COPY

Edited by Professors F. J. E. WOODBRIDGE and WENDELL T. BUSH of Columbia University.

There is no similar journal in the field of scientific philosophy. It is identified with no philosophical tradition, and stands preeminently for the correlation of philosophy with the problems and experience of the present.

Among the many psychological articles appearing in this Journal are the following of recent date:

Measures of Intelligence: A. T. POFFENBERGER
The Identity of Instinct and Habit: KNIGHT DUNLAP
Must We Give Up Instincts in Psychology? J. R. GEIGER
The Modification of Instinct: WALTER S. HUNTER
Mr. Russell's Psychology: F. C. S. SCHILLER
Intelligence and Intellect: A. A. ROBACK

ARCHIVES OF PHILOSOPHY

Editorial communications should be addressed to
Professor FREDERICK J. E. WOODBRIDGE, Columbia University,
New York City

Order should be sent to ARCHIVES OF PHILOSOPHY
Sub-Station 84, New York City

The numbers are as follows:

The Concept of Control. SAVILLA ALICE ELKUS. 40 cents.
The Will to Believe as a Basis for the Defense of Religious Faith. ETTIE STETTHEIMER. $1.
The Individual: A Metaphysical Inquiry. WILLIAM FORBES COOLEY. $1.00.
The Ethical Implications of Bergson's Philosophy. UNA BARNARD SAIT. $1.25.
Religious Values and Intellectual Consistency. EDWARD H. REISNER. 75 cents.
Rosmini's Contribution to Ethical Philosophy. JOHN FAVATA BRUNO. 75 cents.
The Ethics of Euripides. RHYS CARPENTER. 50 cents.
The Logic of Bergson. GEORGE WILLIAM PECKHAM. 75 cents.
The Metaphysics of the Supernatural as illustrated by Descartes. LINA KAHN. $1.00.
Idea and Essence in the Philosophies of Hobbes and Spinoza. ALBERT G. A. BALZ. $1.25.
The Moral and Political Philosophy of John Locke. STERLING TOWER LAMPREICHT. $1.50.
Science and Social Progress. HERBERT WALLACE SCHNEIDER. $1.25.

Date Due

LIBRARY BUREAU FORM 1137.3

RIODICALS

ll.
B. Titchener.
nded 1887.

nley Hall.
ounded 1891.
ew Company.

d C. Warren.
ew Company.
erature.

Review Company.
y James R. Angell.
esearches.
w Company.
Madison Bentley.

ell T. Bush.
s of Psychology.
d by R. S. Woodworth.
experimental study.
ston.
n Prince.
mal and social.
ess.
Founded 1907.

Without fixed dates (9 numbers). Orthogenics, psychology, hygiene.

Training School Bulletin. Vineland, N. J.: The Training School.
Subscription $1. 160 pages annually. Edited by E. R. Johnstone. Founded 1904.
Monthly (10 numbers). Psychology and training of defectives.

Journal of Educational Psychology. Baltimore: Warwick & York.
Subscription $4. 576 pages annually. Founded 1910.
Monthly (9 numbers). Managing Editor, Harold O. Rugg.
(Educational Psychology Monographs.
Published separately at varying prices. Same publishers.)

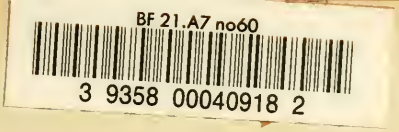
Comparative Psychology Monographs—Baltimore: Williams & Wilkins Co.
Subscription $5. 500 pages per volume. Edited by W. S. Hunter.
Published without fixed dates, each number a single research.

Psychoanalytic Review. Washington, D. C.: 3617 10th Street, N. W.
Subscription $6. 500 pages annually. Psychoanalysis.
Quarterly. Founded 1913. Edited by W. A. White and S. E. Jelliffe.

Journal of Experimental Psychology—Princeton, N. J.
Psychological Review Company. 480 pages annually. Experimental.
Subscription $4.25. Founded 1916. Bi-monthly. Ed. by John B. Watson.

Journal of Applied Psychology. Worcester, Mass.: Florence Chandler.
Subscription $4. 400 pages annually. Founded 1917.
Quarterly. Edited by James P. Porter and William F. Book.

Journal of Comparative Psychology—Baltimore: Williams & Wilkins Co.
Subscription $5. 500 pages per volume. Founded 1921.
Bi-monthly. Edited by Knight Dunlap and Robert M. Yerkes.



This book may be kept.....ONE.....weeks.

A fine of two cents will be charged for each day books or magazines are kept overtime.

Two books may be borrowed from the Library at one time.

Any book injured or lost shall be paid for by the person to whom it is charged.

No member shall transfer his right to use the Library to any other person.

BF 21.A7 no60
3 9358 00040918 2